Service Manual

MODELS: A16EM4H4R36
A16CI4H4R36

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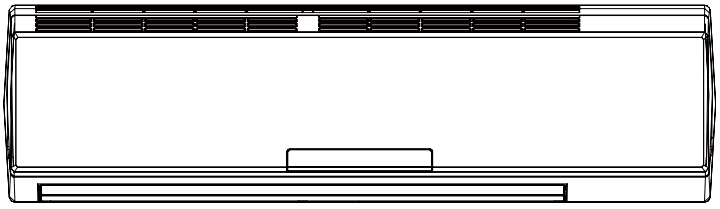
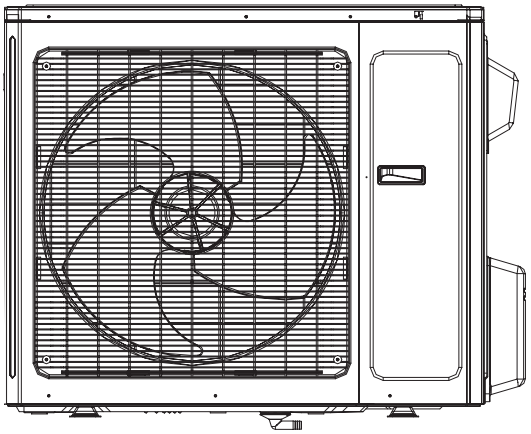
Summary and Features

Indoor Unit:



Outdoor Unit:



Remote Controller:

YB1F2F

1. Safety Precautions

Installing, starting up, and servicing air conditioner can be hazardous due to system pressure, electrical components, and equipment location, etc.

Only trained, qualified installers and service personnel are allowed to install, start-up, and service this equipment. Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When handling the equipment, observe precautions in the manual and on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses andwork gloves. Keep quenching cloth and fire extinguisher nearby when brazing.

Read the instructions thoroughly and follow all warnings or cautions in literature and attached to the unit. Consult local building codes and current editions of national as well as local electrical codes.

Recognize the following safety information:

⚠ Warning	Incorrect handling could result in personal injury or death.
⚠ Caution	Incorrect handling may result in minor injury,or damage to product or property.

⚠ Warning

All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.

- Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.
- Never supply power to the unit unless all wiring and tubing are completed, reconnected and checked.
- This system adopts highly dangerous electrical voltage. Incorrect connection or inadequate grounding can cause personal injury or death. Stick to the wiring diagram and all the instructions when wiring.
- Have the unit adequately grounded in accordance with local electrical codes.
- Have all wiring connected tightly. Loose connection may lead to overheating and a possible fire hazard.

All installation or repair work shall be performed by your dealer or a specialized subcontractor as there is the risk of fire, electric shock, explosion or injury.

- Make sure the outdoor unit is installed on a stable, level surface with no accumulation of snow, leaves, or trash beside.
- Make sure the ceiling/wall is strong enough to bear the weight of the unit.
- Make sure the noise of the outdoor unit does not disturb neighbors.
- Follow all the installation instructions to minimize the risk of damage from earthquakes, typhoons or strong winds.
- Avoid contact between refrigerant and fire as it generates poisonous gas.
- Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture and other hazards.
- Make sure no refrigerant gas is leaking out when installation is completed.
- Should there be refrigerant leakage, the density of refrigerant in the air shall in no way exceed its limited value, or it may lead to explosion.
- Keep your fingers and clothing away from any moving parts.
- Clear the site after installation. Make sure no foreign objects are left in the unit.
- Always ensure effective grounding for the unit.

⚠ Caution

- Never install the unit in a place where a combustible gas might leak, or it may lead to fire or explosion.
- Make a proper provision against noise when the unit is installed at a telecommunication center or hospital.
- Provide an electric leak breaker when it is installed in a watery place.
- Never wash the unit with water.
- Handle unit transportation with care. The unit should not be carried by only one person if it is more than 20kg.
- Never touch the heat exchanger fins with bare hands.
- Never touch the compressor or refrigerant piping without wearing glove.
- Do not have the unit operate without air filter.
- Should any emergency occur, stop the unit and disconnect the power immediately.
- Properly insulate any tubing running inside the room to prevent the water from damaging the wall.

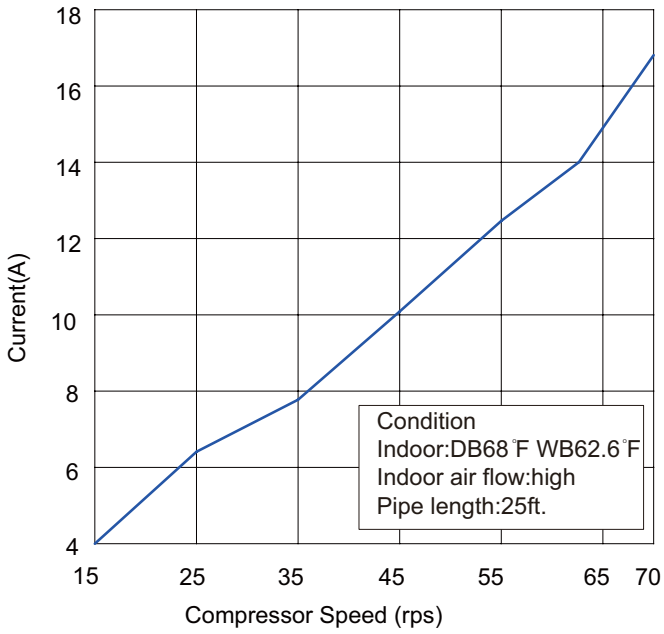
Model			GWH36LB-D3DNA3A
Product Code			CB169000300
Power Supply	Rated Voltage	V ～	208/230
	Rated Frequency	Hz	60
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity (Min ～ Max)		Btu/h	33600(7400~36000)
Heating Capacity (Min ～ Max)		Btu/h	34600(15000~36000)
Cooling Power Input (Min ～ Max)		W	3650(410~3800)
Heating Power Input (Min ～ Max)		W	3560(970~3700)
Cooling Power Current		A	15.9
Heating Power Current		A	15.5
Rated Input		W	4200
Rated Current		A	18.2
Air Flow Volume(SH/H/M/L/SL)		CFM	-/824/706/677/-
Dehumidifying Volume		Pint/h	1.66
EER		Btu/w.h	9.21
COP		Btu/w.h	9.72
SEER		Btu/w.h	16
HSPF		Btu/w.h	8.2
Application Area		sq.ft.	495-753
Indoor Unit	Model of indoor unit		GWH36LB-D3DNA3A/I
	Fan Type		Cross-flow
	Diameter Length(DXL)	inch	Φ4.25X20.58X2
	Fan Motor Cooling Speed (SH/H/ML/SL)	r/min	-/1550/1400/1300/-
	Fan Motor Heating Speed (SH/H/ML/SL)	r/min	-/1550/1400/1300/-
	Output of Fan Motor	W	60
	Fan Motor RLA	A	0.47
	Fan Motor Capacitor	μF	3.5
	Input of Heater	W	-
	Evaporator Form		Aluminum Fin-copper Tub e
	Pipe Diameter	inch	Φ11/40
	Row-fin Gap	inch	2-0.055
	Coil Length (LXDXW)	inch	142.3X1X15
	Swing Motor Model		MP24BA
	Output of Swing Motor	W	2
	Fuse	A	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	-/59/56/53/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	-/69/66/63/-
	Dimension (WXHXD)	inch	53.1X12.8X10.0
	Dimension of Carton Box (LXWXH)	inch	56.6X16.5X13.5
	Dimension of Package (LXWXH)	inch	56.7X16.6X14.0
	Net Weight	lb.	44.1
	Gross Weight	lb.	59.5

Outdoor Unit	Model of Outdoor Unit		
	Compressor Manufacturer/Trademark		MITSUBISHI ELECTRIC (GUANGZHOU)COMPRESSOR CO. LTD/MITSUBISHI
	Compressor Model		TNB306FPGMC
	Compressor Oil		FV50S
	Compressor Type		Rotary
	L.R.A.	A	67
	Compressor RLA	A	13.5
	Compressor Power Input	W	3010
	Overload Protector		CS01F272H01
	Throttling Method		Capillary
	Operation temp	°F	60.8~86
	Ambient temp (cooling)	°F	5~109.4
	Ambient temp (heating)	°F	19.4~75.2
	Condenser Form		Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ3/8
	Rows-fin Gap	inch	2-0.055
	Coil Length (LXDXW)	inch	37.0X1.7X30.0
	Fan Motor Speed	rpm	900
	Output of Fan Motor	W	170
	Fan Motor RLA	A	0.73
	Fan Motor Capacitor	μF	-
	Air Flow Volume of Outdoor Unit	CFM	2589
	Fan Type		Axial-flow
	Fan Diameter	inch	Φ21.73
	Defrosting Method		Automatic Defrosting
	Climate Type		T1
	Isolation		I
	Moisture Protection		IP24
	Permissible Excessive Operating Pressure for the Discharge Side	PSI	551
	Permissible Excessive Operating Pressure for the Suction Side	PSI	174
	Sound Pressure Level (H/M/L)	dB (A)	65/-/-
	Sound Power Level (H/M/L)	dB (A)	75/-/-
	Dimension (WXHXD)	inch	38.6X31.1X16.7
	Dimension of Carton Box (LXWXH)	inch	42.5X19.1X33.1
	Dimension of Package (LXWXH)	inch	42.6X19.2X33.6
	Net Weight	lb.	161.0
	Gross Weight	lb.	169.8
	Refrigerant		R410A
	Refrigerant Charge	oz	84.7
Connection Pipe	Length	ft	24.6
	Gas Additional Charge	oz/ft.	0.5
	Outer Diameter Liquid Pipe	inch	Φ1/4
	Outer Diameter Gas Pipe	inch	Φ5/8
	Max Distance Height	ft	32.8
	Max Distance Length	ft	98.4

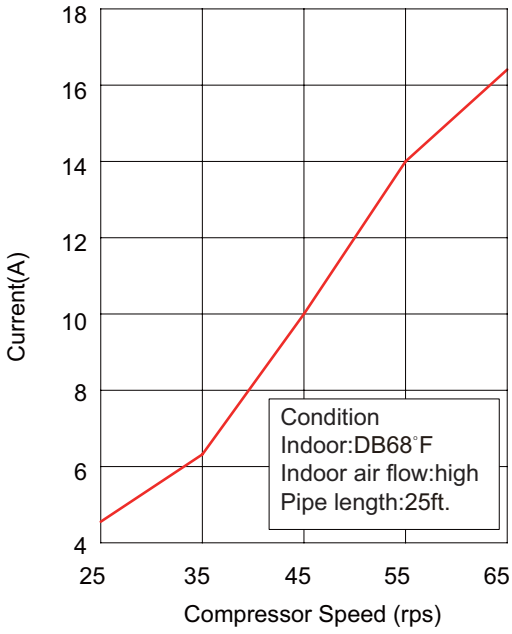
The above data is subject to change without notice. Please refer to the nameplate of the unit.

2.2 Operation Characteristic Curve

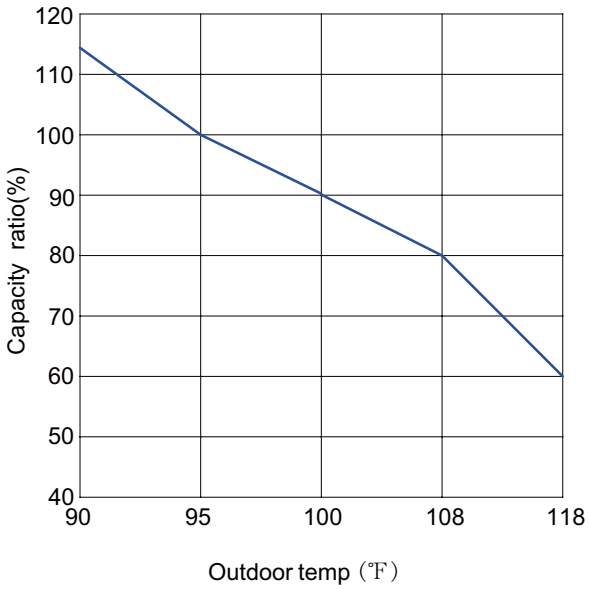
Cooling



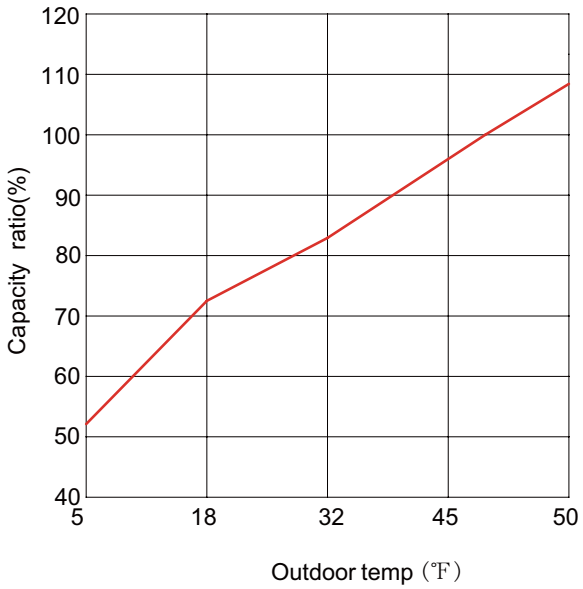
Heatling



Cooling



Heatling



2.4 Operation Data

Cooling

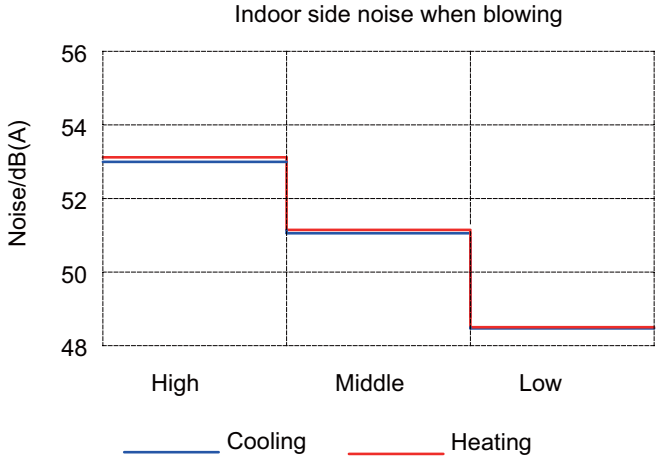
Temperature condition (°F)		Model name	Standard pressure	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode	Compressor revolution (rps)
Indoor	Outdoor		P (MPa)	T1 (°F)	T2 (°F)			
80/66.9	95/75	A16EM4H4R36 A16CI4H4R36	0.77	46.4 to 53.6	124 to 98.6	High	High	68

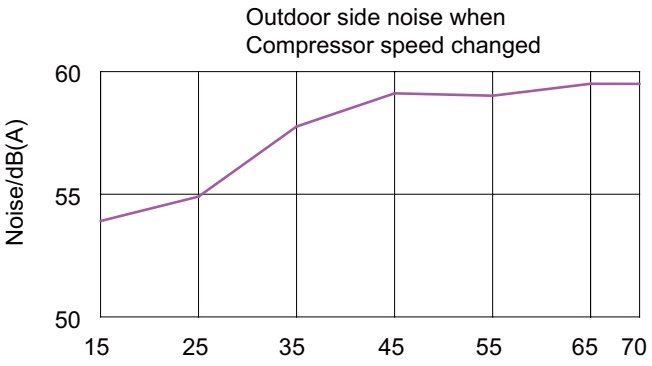
Heatling

Temperature condition (°F)		Model name	Standard pressure	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode	Compressor revolution (rps)
Indoor	Outdoor		P (MPa)	T1 (°F)	T2 (°F)			
70/60.1	47/43	A16EM4H4R36 A16CI4H4R36	3.55	127.4 to 100.4	38.5 to 34	High	High	61

T1: Outlet and inlet pipe temperature of evaporator
T2: Outlet and inlet pipe temperature of condenser
P: Pressure of air pipe used for connecting outdoor and indoor units
NOTES :
(1) Measure surface temperature of heat exchanger pipe around center of heat exchanger path U bent. (Thermistor themometer)
(2) Connecting piping condition :24.6ft.

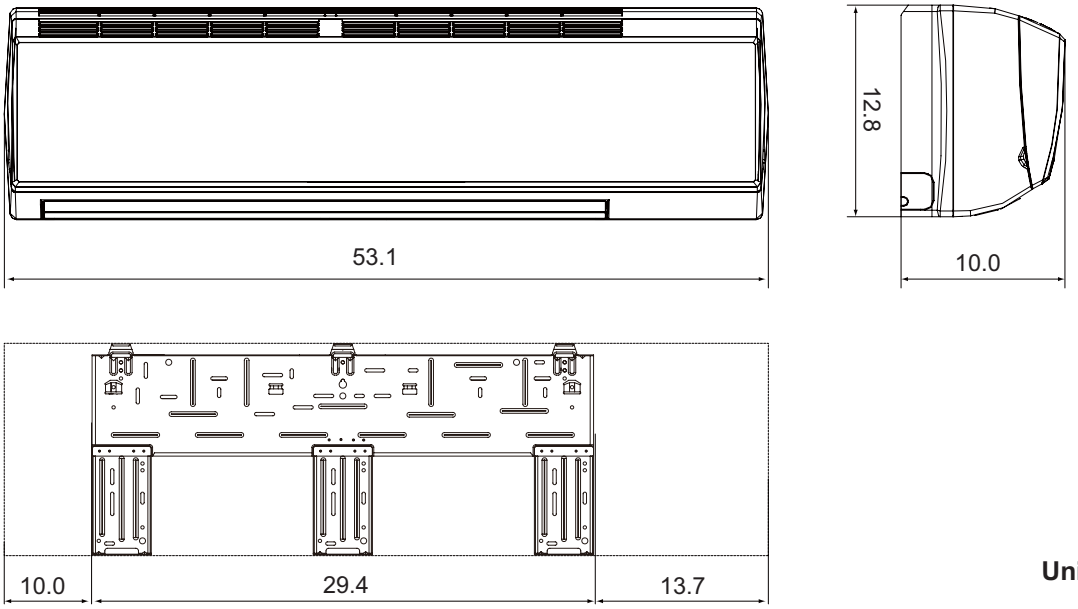
2.5 Noise Criteria Curve Tables for both Models





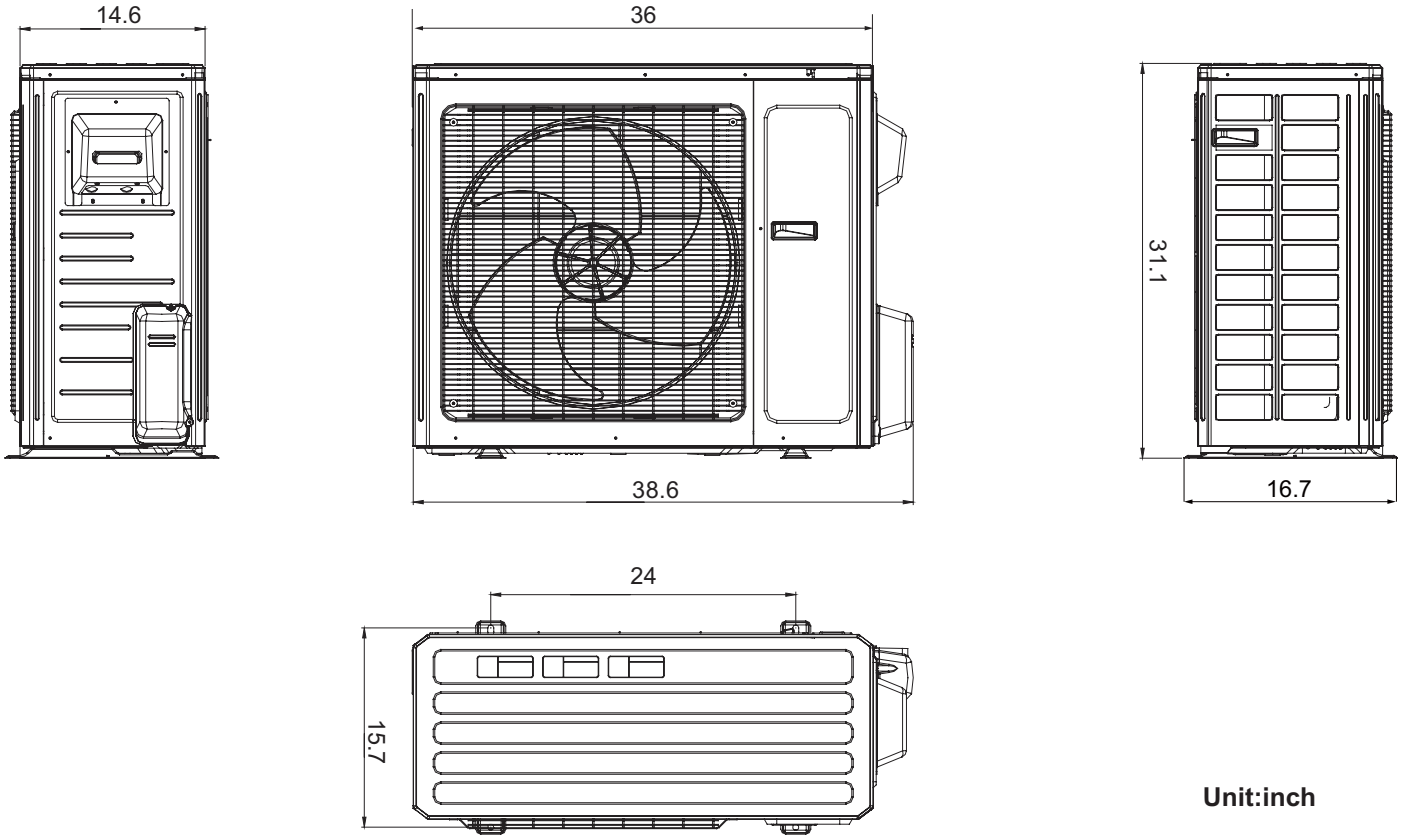
3. Construction Views

3.1 Indoor Unit



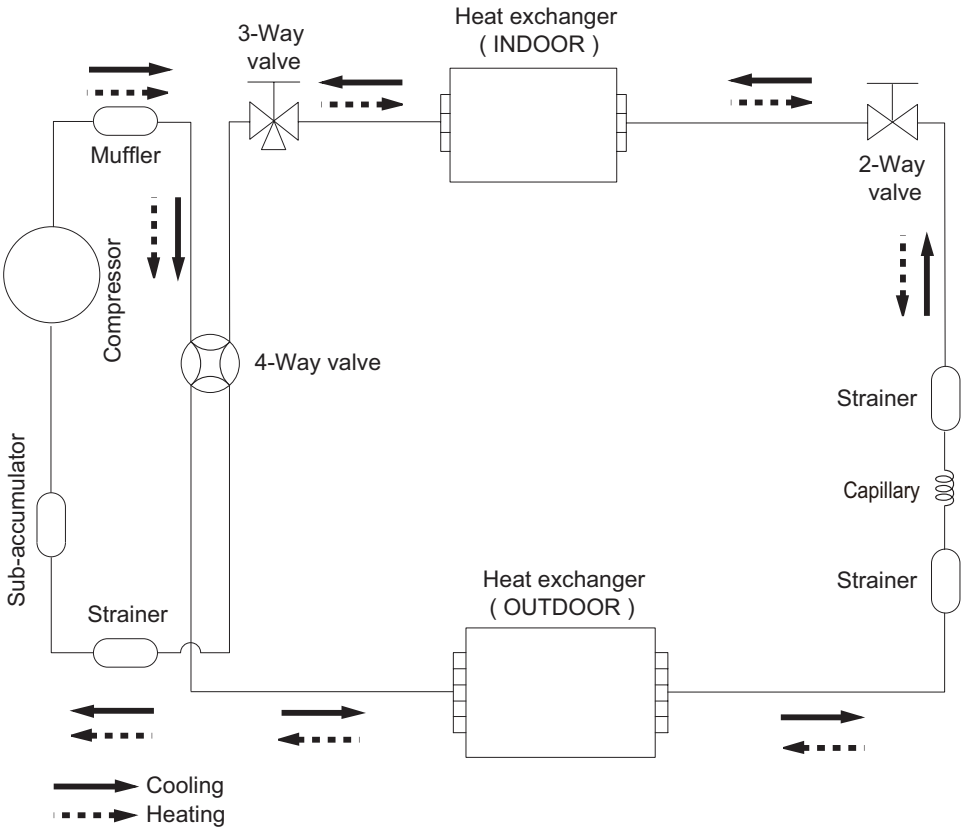
Unit:inch

3.2 Outdoor Unit



Unit:inch

4. Refrigerant System Diagram



5. Schematic Diagram

5.1 Electrical Wiring

- **Electrical Data**

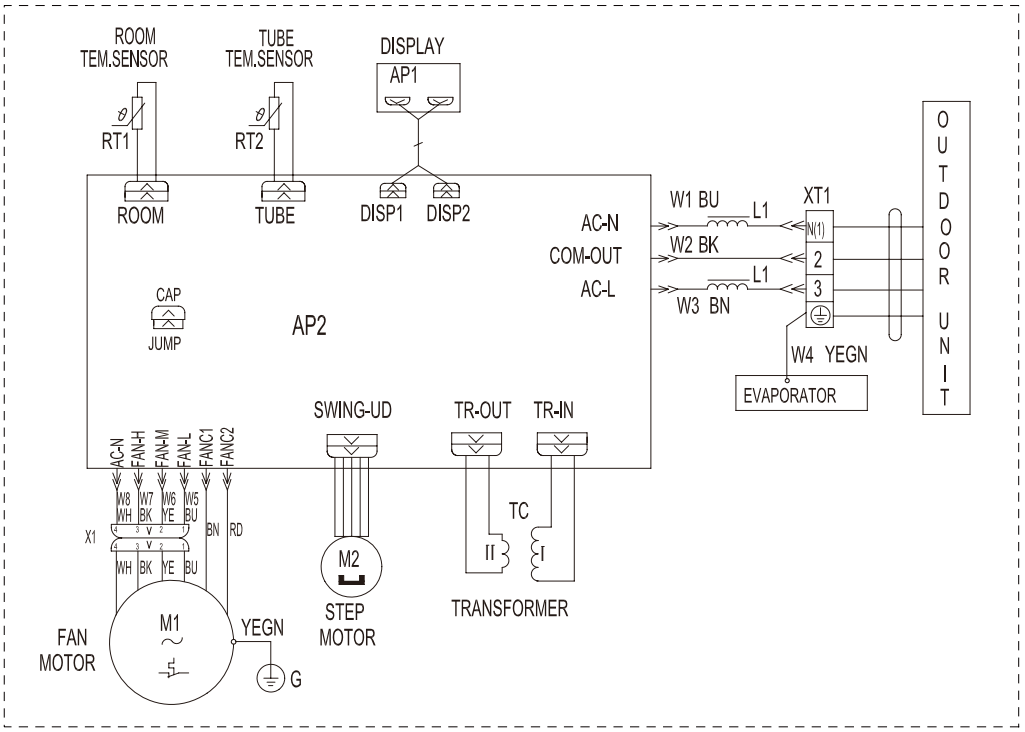
Indoor Unit

Symbo	Part name	Symbol	Color symbol	Symbol	Color symbol
⏚	PROTECTIVE EARTH	**BU**	BLUE	**BN**	BROWN
		YE	YELLOW	**BK**	BLACK
/	/	**RD**	RED	**YEGN**	YELLOW GREEN
/	/	**VT**	VIOLET	**OG**	ORANGE

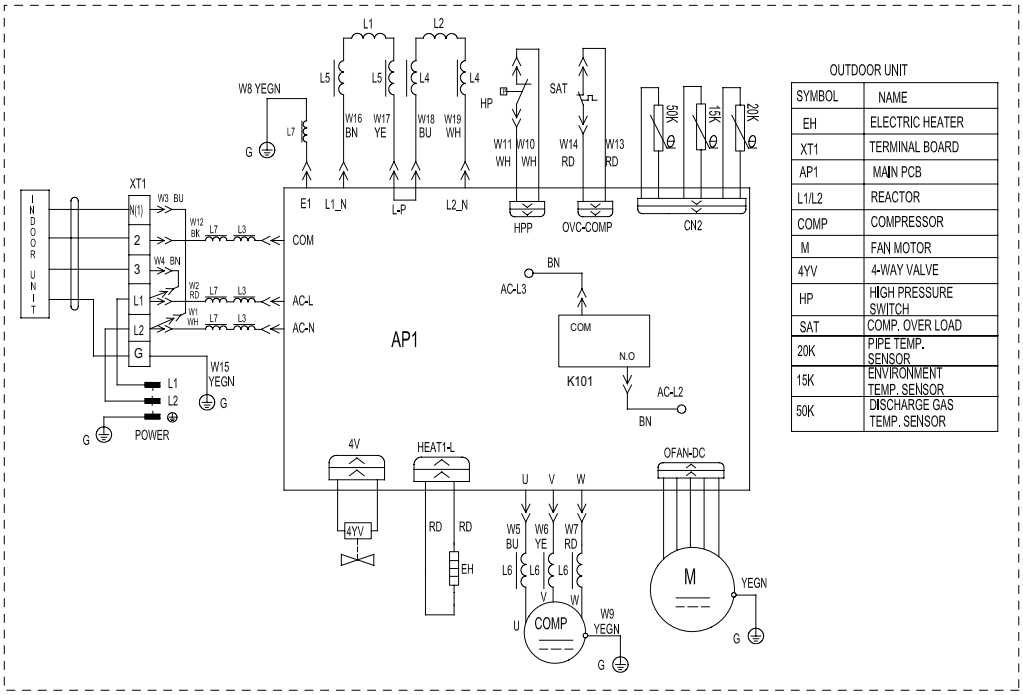
Outdoor Unit

Symbol	Parts name	Symbol	Color symbol	Symbol	Color symbol
SAT	OVERLOAD	**BU**	BLUE	**VT**	VIOLET
COMP	COMPRESSOR	**YE**	YELLOW	**OG**	ORANGE
⏚	PROTECTIVE EARTH	**RD**	RED	**BK**	BLACK
		BN	BROWN	**YEGN**	YELLOW GREEN

- **Indoor Unit**



- **Outdoor Unit**



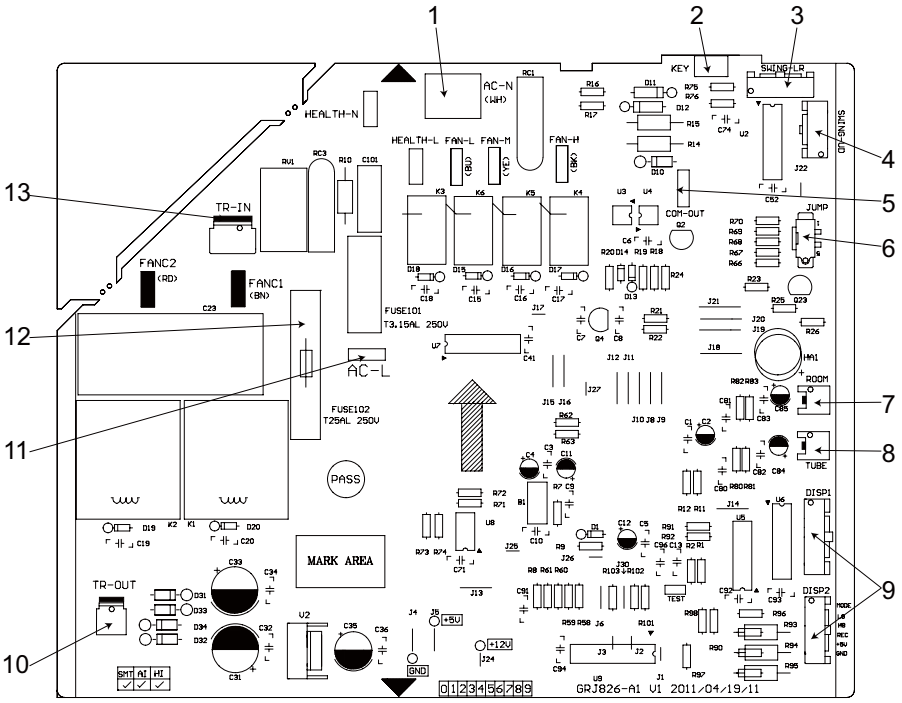
OUTDOOR UNIT

SYMBOL	NAME
EH	ELECTRIC HEATER
XT1	TERMINAL BOARD
AP1	MAIN PCB
L1/L2	REACTOR
COMP	COMPRESSOR
M	FAN MOTOR
4YV	4-WAY VALVE
HP	HIGH PRESSURE SWITCH
SAT	COMP. OVER LOAD
20K	PIPE TEMP. SENSOR
15K	ENVIRONMENT TEMP. SENSOR
50K	DISCHARGE GAS TEMP. SENSOR

5.2 Printed Circuit Board

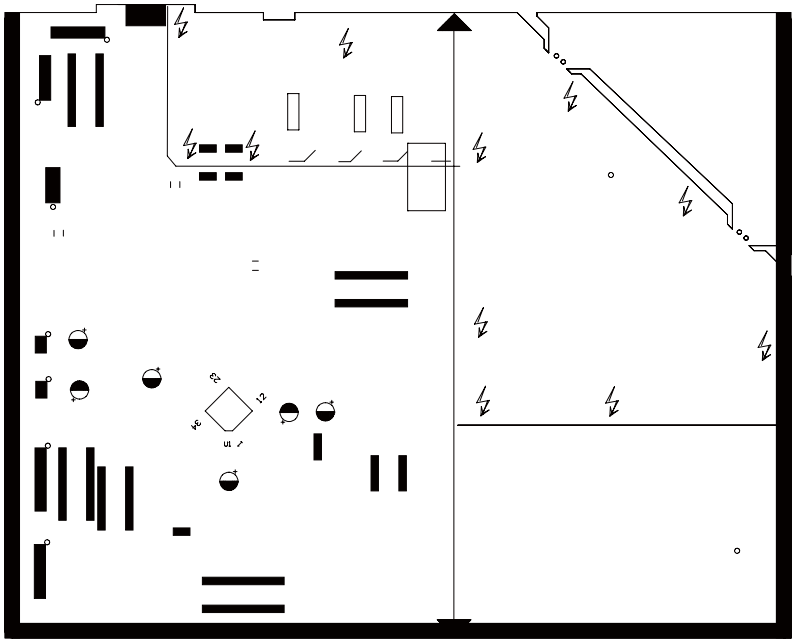
(1) Indoor Unit

- TOP VIEW



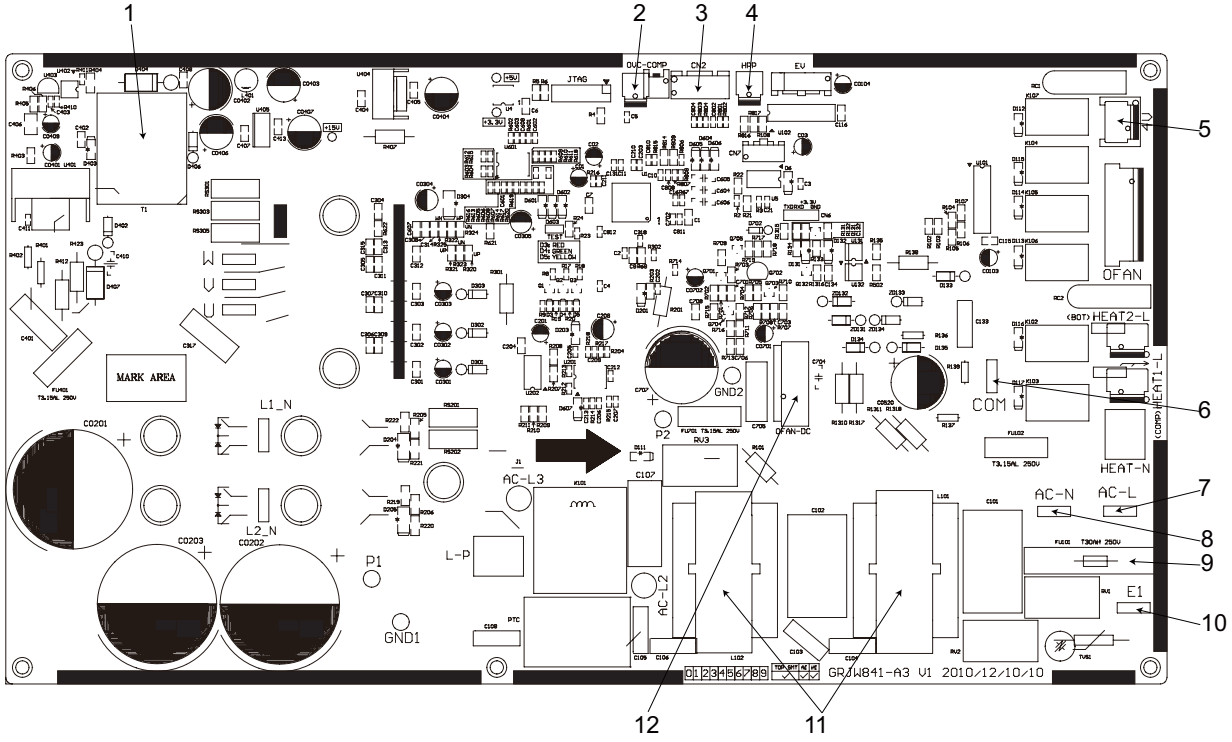
No.	Name
1	Terminal of neutral wire
2	Auto button
3	Terminal of horizontal swing
4	Terminal of vertical swing
5	Communication terminal
6	Jumper cap
7	Terminal of ambient temp sensor
8	Terminal of pipe temp sensor
9	Terminals of display panel 1 and 2
10	Output terminal of transformer
11	Terminal of live wire
12	Protective tube
13	Input terminal of transformer

- BOTTOM VIEW



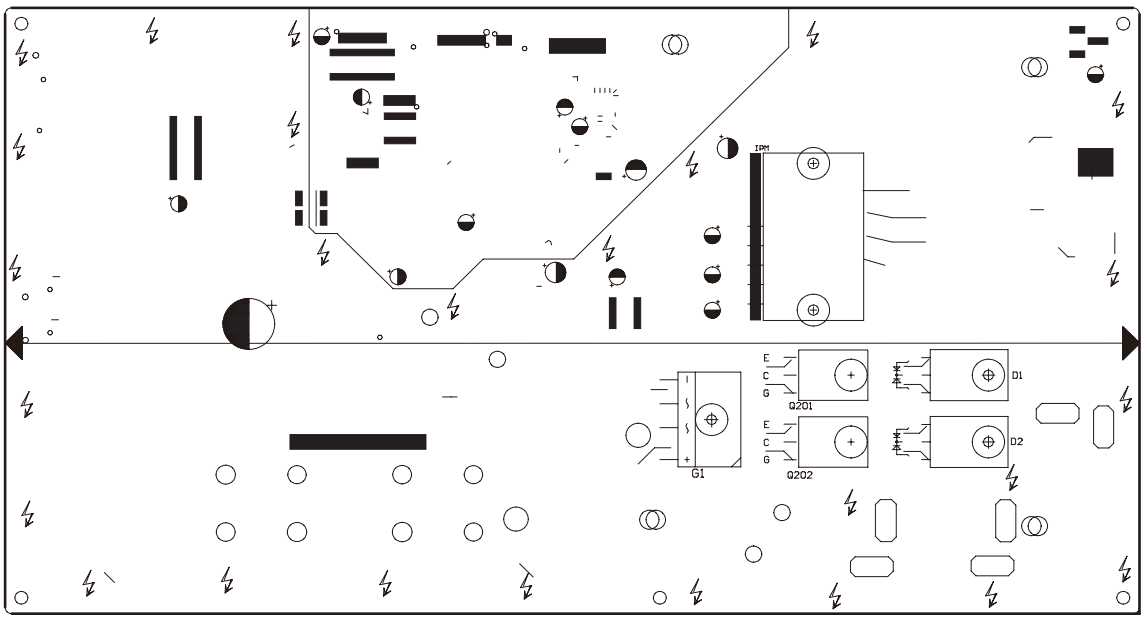
(2) Outdoor Unit

● TOP VIEW



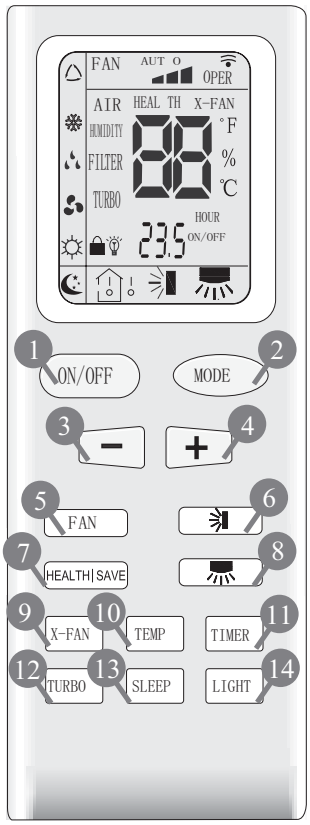
No.	Name	No.	Name	No.	Name
1	High-frequency transformer T1	5	Terminal of 4-way valve	9	Protective tube FU101
2	Terminal of overload protection	6	Communication terminal	10	Terminal of ground wire
3	Terminal of temp sensor	7	Terminal of live wire	11	Choke L 101 and L102
4	Terminal of highpressureprotection	8	Terminal of neutral wire	12	Terminal of outdoor fan OFAN-DC

● BOTTOM VIEW



6. Function and Control

6.1 Remote Control Operations



1 ON/OFF

Press it to start or stop operation.

2 MODE

Press it to select operation mode (AUTO/COOL/DRY/FAN/HEAT).

3 -

Press it to decrease temperature setting.

4 +

Press it to increase temperature setting.

5 FAN

Press it to set fan speed.

6

Press it to set swing angle.

7 HEALTH|SAVE

Press it to turn on or off health function.

8

Press it to set left & right swing angle.

9 X-FAN(X-FAN is the alternative expression of BLOW for the purpose of understanding.)

10 TEMP

11 TIMER

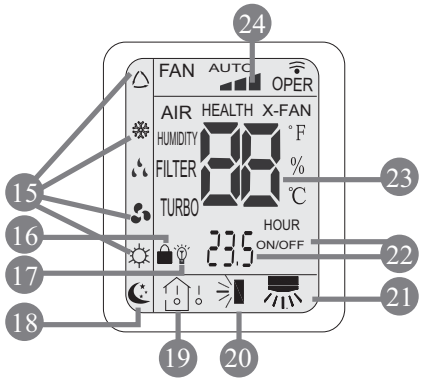
Press it to set timer ON/ timer OFF.

12 TURBO

13 SLEEP

14 LIGHT

Press it to turn on/off the light.



15 MODE icon:

If MODE button is pressed, current operation mode icon (AUTO), (COOL), (DRY), (FAN) or (HEAT is only for heat pump models) will show.

16 LOCK icon:

is displayed by pressing "+" and "-" buttons simultaneously. Press them again to clear the display.

17 LIGHT icon:

is displayed by pressing the LIGHT button. Press LIGHT button again to clear the display.

18 SLEEP icon :

is displayed by pressing the SLEEP button. Press this button again to clear the display.

19 TEMP icon:

Pressing TEMP button, (set temperature), (ambient temperature) , (outdoor ambient temperature) and blank is displayed circularly.

20 Up & down swing icon:

is displayed when pressing the up & down swing button. Press this button again to clear the display.

21 Left & right swing icon:

is displayed when pressing the left & right swing button.Press this button again to clear the display.

22 SET TIME display:

After pressing TIMER button, ON or OFF will blink.This area will show the set time.

23 DIGITAL display:

This area will show the set temperature. In SAVE mode,"SE" will be displayed.

24 FAN SPEED display:

Press FAN button to select the desired fan speed setting(AUTOLow-Med-High).Your selection will be displayed in the LCD windows, except the AUTO fan speed.

Remote controller description

1 ON/OFF:

Press this button to turn on the unit. Press this button again to turn off the unit.

2 MODE:

Each time you press this button,a mode is selected in a sequence that goes from AUTO, COOL,DRY, FAN, and HEAT *, as the following:

AUTO ▶ COOL ▶ DRY ▶ FAN ▶ HEAT*

*Note: Only for models with heating function.

After energization, AUTO mode is defaulted. In AUTO mode, the set temperature will not be displayed on the LCD, and the unit will automatically select the suitable operation mode in accordance with the room temperature to make indoor room comfortable.

3 + :

Press this button to increase set temperature. Hold it down for above 2 seconds to rapidly increase set temperature. In AUTO mode, set temperature is not adjustable.

4 -:

Press this button to decrease set temperature. Hold it down for above . 2 seconds to rapidly decrease set temperature. In AUTO mode, set temperature is not adjustable.

5 FAN :

This button is used for setting fan speed in the sequence that goes from AUTO, , , to then back to Auto.

AUTO → → → →

Low speed Medium speed High speed

6

●Press button to start or stop up & down swing function.The remote controller defaults to simple swing condition.

●Press + button and button at the same time at unit OFF to switch between simple swing and static swing; blinks for 2 seconds.

●In static swing condition, pressing button, the swing angle of up & down louver changes as below:

OFF

●If the unit is turned off during swing operation,the louver will stop at present position.

7 HEALTH|SAVE:

HEALTH function:there is no this function for this unit. If press this key, the main unit will click, but it also runs under original status.

Save energy function: this unit has no this function, press this button, the mian unit will click, "SE" will be displayed on the LCD of wireless remote control, fan speed automatically rotates, when repress this button, the fan speed will run at previous setting fan speed.

8

There is no this function for this unit. If press this key, the main unit will click, but it also runs under original status.

9 X-FAN:

Pressing X -FAN button in COOL or DRY mode,the icon "X-FAN" is displayed and the indoor fan will continue operation for 10 minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO, FAN and HEAT mode.

10 TEMP:

When there is , or blank on remote control, set temperature is displayed on indoor unit.

When is displayed on remote control, indoor ambient temperature is displayed on indoor unit.

11 TIMER:

Press TIMER button at unit ON to set TIMER OFF; HOUR OFF blinks. Press TIMER button at unit OFF to set TIMER ON; HOUR ON blinks. In this case, pressing + or - button changes time setting. Holding down either button rapidly changes time setting (time setting range 0.5-24hours). Press TIMER button again to confirm setting; HOUR ON/OFF stops blinking. If there is not any operation of button within 5 seconds during HOUR ON/OFF blinking, TIMER setting will be cancelled.

12 TURBO:

Press this button to activate / deactivate the Turbo function which enables the unit to reach the preset temperature in shortest time. In COOL mode, the unit will blow strong cooling air at super high fan speed. In HEAT mode, the unit will blow strong heating air at super high fan speed.

13 SLEEP :

●Press this button, enter into SLEEP state,when repressed, it will quit. The sleep function will be canceled with the stop of the unit. There is no SLEEP function under AUTO and FAN mode. is the icon for sleepfunction.

●At COOL, DRY mode: the SLEEP mode runs after 1hour, the setting temp. will be increased by 1 ℃, 2 hour later, setting temp. will be increased by 2℃ and then will run at this setting temperature.

●At HEAT mode: the SLEEP mode runs after 1hour, the setting temp will be decreased by1℃, 2 hours later setting temp. will be decreased by2℃, then it will run.

14 LIGHT:

Press LIGHT button to turn on the display's light and press this button again to turn off the display's light. If the light is turned on , is displayed. If the light is tunrned off, disappears.

15 Combination of "+" and "-" buttons: About lock

Press "+ " and " " buttons simultaneously to lock or unlock the keypad. If the remote controller is locked, is displayed. In this case, pressing any button, blinks three times.

16 Combination of "MODE" and "-" buttons:About switch between Fahrenheit and Centigrade.At unit OFF, press "MODE" and "- " buttons simultaneously to switch between ℃ and ℉ .

Replacement of Batteries

1.Remove the battery cover plate from the rear of the remote controller. (As shown in the figure)

2.Take out the old batteries.

3.Insert two new AAA1.5V dry batteries, and pay attention to the polarity.

4. Reinstall the battery cover plate.

★Notes:

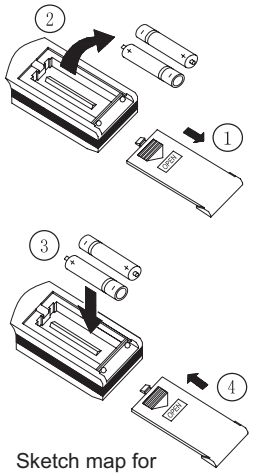
●When replacing the batteries, do not use old or different batteries, otherwise, it may cause malfunction.

●If the wireless remote controller will not be used for a long time, please remove batteries to prevent damage from leaking batteries.

●The operation should be performed in its receiving range.

●It should be kept 1m away from the TV set or stereo sound sets.

●If the wireless remote controller does not operate normally, please take the batteries out and reinsert them after 30 seconds. If it still can't operate properly, replace the batteries.



Sketch map for replacing batteries

6.2 Description of Each Control Operation

1. Temperature Parameters

◆ Indoor preset temperature (T_{preset})

◆ Indoor ambient temperature ($T_{amb.}$)

2. Basic Functions

Once energized, in no case should the compressor be restarted within less than 3 minutes. In the situation that memory function is available, for the first energization, if the compressor is at stop before de-energization, the compressor will be started without a 3-minute lag; if the compressor is in operation before de-energization, the compressor will be started with a 3-minute lag; and once started, the compressor will not be stopped within 6 minutes regardless of changes in room temperature;

(1) Cooling Mode

①Working conditions and process of cooling

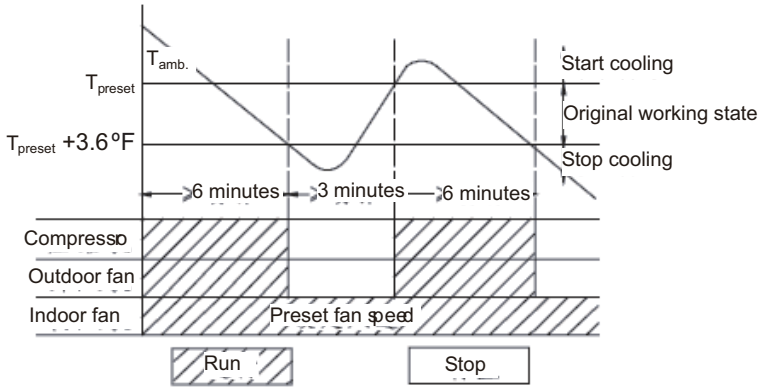
When $T_{amb} \geq T_{preset}$, the unit will enter cooling operation, in which case the indoor fan, the outdoor fan and the compressor will work and the indoor fan will run at preset speed.

When $T_{amb} \leq T_{preset}$ -3.6 ºF , the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will run at preset speed.

When T_{preset} -3.6 ºF < $T_{amb.}$< T_{preset} +1.8 ºF , the unit will remain at its previous state.

➢ Under this mode, the four-way valve will be de-energized and temperature can be set within a range from 61 to 86ºF

If the compressor is shut down for some reason, the indoor fan and the swing device will operate at original state.



② Protection

◆ Antifreeze protection

Under cooling and dehumidifying mode, 6 minutes after the compressor is started:

If $T_{evap} \leq 35.6$ ºF, the compressor will operate at reduced frequency.

If $T_{evap} \leq 30.2$ºF is detected for durative 3 minutes, the compressor will stop, and after 60 seconds, the outdoor fan will stop; and under cooling mode, the indoor fan and the swing motor will remain at the original state.

If $T_{evap.} \geq 42.8$ ºF and the compressor has remained at OFF for at least 3 minutes, the compressor will resume its original operation state.

◆ Total current up and frequency down protection

If $I_{total} \leq$16A, frequency rise will be allowed; if $I_{total} \geq$17A, frequency rise will not be allowed; if $I_{total} \geq$ 18A, the compressor will run at reduced frequency; and if $I_{total} \geq$ 20A, the compressor will stop and the outdoor fan will stop with a time lag of 60s.

(2) Dehumidifying Mode

①Working conditions and process of dehumidifying

If T_{amb}>T_{preset} +1.8ºF, the unit will enter cooling and dehumidifying mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If T_{preset} -3.6 ºF $\leq T_{amb} \leq T_{preset}$ +1.8ºF, the compressor remains at its original operation state.

If $T_{amb.}$< T_{preset} -3.6ºF, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will operate at low speed.

② Protection

Protection is the same as that under the cooling mode.

(3) Heating Mode

①Working conditions and process of heating

If $T_{amb.} \leqslant$ Tpreset +3.6°F, the unit enters heating mode, in which case the four-way valve, the compressor and the outdoor fan will operate simultaneously, and the indoor fan will run at preset speed in the condition of preset cold air prevention.

If $T_{amb.} \geqslant T_{preset}$ +9°F, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will stop after 60-second blow at low speed

If T_{preset} +3.6°F $< T_{amb.} <$ T_{preset} +9°F, the unit will maintain its original operating status.

- Under this mode, the four-way valve is energized and temperature can be set within a range of 61 - 86°F. The operating symbol, the heating symbol and preset temperature are revealed on the display.

②Condition and process of defrost

When duration of successive heating operation is more than 45 minutes, or accumulated heating time more than 90 minutes, and one of the following conditions is reached, the unit will enter the defrost mode after 3 minutes.

A $T_{outdoor\ amb.} \geq 41℉$, $T_{outdoor\ pipe} \leq 28.4℉$;
B $28.4℉ \leq T_{outdoor\ amb.}$
C $23℉ \leq T_{outdoor\ amb.} < 28.4℉$, $T_{outdoor\ pipe} \leq 17.6℉$;
D $14℉ \leq T_{outdoor\ amb.} < 23℉$, $T_{outdoor\ pipe} - T_{compensation} \leq (T_{outdoor\ amb} - 5.4℉)$;
E $T_{outdoor\ amb.} < 14℉$, $T_{outdoor\ pipe} - T_{compensation} \leq (T_{outdoor\ amb.} - 5.4℉)$

After energization, when defrosting for the first time $T_{compensation}$=0℉. If it is not the firstly time for defrosting, the $T_{compensation}$ is determined by the $T_{outdoor\ pipe}$ of last time quitting defrosting.
a. Toutdoor pipe ＞35.6℉, Tcompensation=0℉; b. Toutdoor pipe ≤35.6℉, Tcompensation=5.4℉

At that time, the indoor fan stops and the compressor stops, and after 60 seconds the outer fan will stop, and then after 30 seconds, the four-way valve will stop. After 30 seconds, the compressor is initiated for raising the frequency to defrost frequ ency. When the compressor has operated under defrost mode for 10 minutes, or $T_{outer\ tube} \geqslant 50℉$, the compressor will be converted to 46Hz operation. After 30 seconds, the compressor will stop. And after another 30 seconds, the four-way valve will be opened, and after 60 seconds, the compressor and the outer fan will be started, the indoor fan will run under preset cold air prevention conditions, and H1 will be displayed at temperature display area on the display panel. Defrost frequency is 70Hz.

3.Protection

◆ Cold air prevention

The unit is started under heating mode (the compressor is ON):

①In the case of $T_{indoor\ amb.}$ <75°F: if $T_{tube} \leqslant$ 104°F and the indoor fan is at stop state, the indoor fan will begin to run at low speed with a time lag of 2 minutes. Within 2 minutes, if T_{tube}>104°F, the indoor fan also will run at low speed; and after 1-minute operation at low speed, the indoor fan will be converted to operation at preset speed. Within 1-minute low speed operation or 2-minute non-operation, if T_{tube}>108°F , the fan will run at present speed.

②In the case of $T_{indoor\ amb.} \geqslant$ 75°F : if $T_{tube} \leqslant$ 108°F, the indoor fan will run at low speed, and after one minute, the indoor fan will be converted to preset speed. Within one-minute low speed operation, if T_{tube}>104°F , the indoor fan will be converted to preset speed.

Note: $T_{indoor\ amb.}$ indicated in ①and ②refers to, under initially heating mode, the indoor ambient temperature before the command to start the compressor is performed according to the program, or after the unit is withdrawn from defrost, the indoor ambient temperature before the defrost symbol is cleared.

◆ Total current up and frequency down protection

If the total current $I_{total} \leqslant$ 16A, frequency rise will be allowed; if $I_{total} \geqslant$ 17A,frequency rise will not be allowed; if $I_{total} \geqslant$ 18A,the compressor will run at reduced frequency; and if $I_{total} \geqslant$ 20A, the compressor will stop and the outdoor fan will stop with a time lag of 60s.

(4) Fan Mode

Under the mode, the indoor fan will run at preset speed and the compressor, the outdoor fan, the four-way valve and the electric heater will stop.

- Under the mode, temperature can be set within a range of 61 - 86°F .

(5) AUTO Mode

①Working conditions and process of AUTO mode

Under AUTO mode, standard cooling temperature T_{preset} is 77°F and standard heating temperature T_{preset} is 68°F.

a. Once energized, if $T_{amb} \leqslant$ 71.6°F, the unit will be started under heating mode; if 71.6°F< $T_{amb.}$< 78.8°F, the unit will run under fan mode and the run indicator will be bright; and if $T_{amb} \geqslant$ 78.8°F, the unit will be started under cooling mode.

b.Under AUTO mode,if $T_{amb.} \geq T_{preset}+1.8°F$ is detected,the unit will select to run under cooling mode,in which case implicit preset temperature is 77°F ; if $T_{amb.} \leq T_{preset}-1.8°F$, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run at preset speed; and if $T_{preset}-1.8°F < T_{amb.} < T_{preset}+1.8°F$, the unit will remain at its original state.
c. Under AUTO mode, if $T_{amb.} \leq T_{preset}+3.6°F$ is detected, the unit will select to run under heating mode, in which case implicit preset temperature is 64°F; if $T_{amb.} \geq T_{preset}+9°F$, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run under the mode of residue heat blowing; and if $T_{preset}+3.6°F < T_{amb.} < T_{preset}+41°F$, the unit will remain atits original state. The cooling-only unit will run under fan mode.
d. Under AUTO mode, if $71.6°F < Tamb. < 78.8°F$, the unit will remain at its original state.

② Protection
a. In cooling operation, protection is the same as that under the cooling mode;
b. In heating operation, protection is the same as that under the heating mode;
c. When ambient temperature changes, operation mode will be converted preferentially. Once started, the compressor will remain unchanged for at least 6 minutes.
(6) Common Protection Functions and Fault Display under COOL, HEAT, DRY and AUTO Modes
① Overload protection
T_{tube}: measured temperature of outdoor heat exchanger under cooling mode; and measured temperature of indoor heat exchanger under heating mode.
1) Cooling overload
a. If $T_{tube} \leq 126°F$, the unit will return to its original operation state.
b. If $T_{tube} \geq 131°F$, frequency rise is not allowed.
c. If $T_{tube} \geq 136°F$, the compressor will run at reduced frequency.
d. If $T_{tube} \geq 144°F$, the compressor will stop and the indoor fan will run at preset speed.
2) Heating overload
a. If $T_{tube} \leq 126°F$, the unit will return to its original operation state.
b. If $T_{tube} \geq 131°F$, frequency rise is not allowed.
c. If $T_{tube} \geq 136°F$, the compressor will run at reduced frequency.
d. If $T_{tube} \geq 144°F$, the compressor will stop and the indoor fan will blow residue heat and then stop.
② Exhaust temperature protection of compressor
If exhaust temperature $\geq 208°F$, frequency is not allowed to rise.
If exhaust temperature $\geq 217°F$, the compressor will run at reduced frequency.
If exhaust temperature $\geq 230°F$, the compressor will stop.
If exhaust temperature $\leq 194°F$ and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.
③Communication fault
If the unit fails to receive correct signals for durative 3 minutes, communication fault can be justified and the whole system will stop.
④Module protection
Under module protection mode, the compressor will stop. When the compressor remains at stop for at least 3 minutes, the compressor will resume its operation. If module protection occurs six times in succession, the compressor will not be started again.
⑤Overload protection
If temperature sensed by the overload sensor is over 239°F, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. If temperature is below 203°F , the overload protection will be relieved .
If voltage on the DC bus is below 150V or over 420V, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. When voltage on the DC bus returns to its normal value and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.
⑥ Faults of temperature sensors

Designation of sensors	Faults
Indoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Indoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds, and no detection is performed within 10 minutes after defrost begins.
Exhaust	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.
Overload	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.

7. Installation Manual

7.1 Notices for Installation

Caution

1.The unit should be installed only by authorized service center according to local or government regulations and in compliance with this manual.

2.Before installing, please contact with local authorized maintenance center. If the unit is not installed by the authorized service center, the malfunction may not be solved due to incovenient contact between the user and the service personnel.

3.When removing the unit to the other place, please firstly contact with the local authorized service center.

4.Warning: Before obtaining access to terminals, all supply circuits must be disconnected.

5.For appliances with type Y attachment, the instructions shall contain the substance of the following. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

6.The appliance must be positioned so that the plug is accessible.

7.The temperature of refrigerant line will be high; please keep the interconnection cable away from the copper tube.

8.The instructions shall state the substance of the following:

This appliance is not intended for use by persons(including children)with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

7.1.1 Installation Site Instructions

Proper installation site is vital for correct and efficient operation of the unit. Avoid the following sites where:

●strong heat sources, vapours, flammable gas or volatile liquids are emitted.

●high-frequency electro-magnetic waves are generated by radio equipment, welders and medical equipment.

●salt-laden air prevails (such as close to coastal areas).

●the air is contaminated with industrial vapours and oils.

●the air contains sulphures gas such as in hot spring zones.

●corrosion or poor air quality exists.

7.1.2 Installation Site of Indoor Unit

1.The air inlet and outlet should be away from the obstructions. Ensure the air can be blown through the whole room.

2.Select a site where the condensate can be easily drained out, and where it is easily connected to outdoor unit.

3.Select a place where it is out of reach of children.

4.Select a place where the wall is strong enough to withstand the full weight and vibration of the unit.

5.Be sure to leave enough space to allow access for routine maintenance. The installation site should be 66 in. or more above the floor.

6.Select a place about 39.4 in. or more away from TV set or any other electric appliance.

7.Select a place where the filter can be easily taken out.

8.Make sure that the indoor unit is installed in accordance with installation dimension instructions.

9.Do not use the unit in the laundry or by swimming pool etc.

7.1.3 Installation Site of Outdoor Unit

1.Select a site where noise and outflow air emitted by the unit will not annoy neighbors.

2.S elect a site where there is sufficient ventilation.

3.Select a site where there is no obstruction blocking the inlet and outlet.

4.The site should be able to withstand the full weight and vibration.

5.Select a dry place, but do not expose the unit to direct sunlight or strong wind.

6.Make sure that the outdoor unit is installed in accordance with the installation instructions,and is convenient for maintenance and repair.

7.The height difference between indoor and outdoor units is within 32.8ft., and the length of the connecting tubing does not exceed 98.4ft.

8.Select a place where it is out of reach of children.

9.Select a place where the unit does not have negative impact on pedestrians or on the city.

7.1.4 Safety Precautions for Electric Appliances

1.A dedicated power supply circuit should be used in accordance with local electrical safety regulations.

2.Don't drag the power cord with excessive force.

3.The unit should be reliably earthed and connected to an exclusive earth device by the professionals.

4.The air switch must have the functions of magnetic tripping and heat tripping to prevent short circuit and overload.

5.The minimum distance between the unit and combustive surface is 4.9ft..

6.The appliance shall be installed in accordance with national wiring regulations.

7.An all-pole disconnection switch with a contact separation of at least 0.1in. in all poles should be connected in fixed wiring.

Note:

●Make sure the live wire, neutral wire and earth wire in the family power socket are properly connected. There should be reliable circuit in the diagram.

●Inadequate or incorrect electrical connections may cause electric shock or fire.

7.1.5 Earthing Requirements

1.Air conditioner is type I electric appliance. Please ensure that the unit is reliably earthed.

2.The yellow-green wire in air conditioner is the earthing wire which can not be used for other purposes. Improper earthing may cause electric shock.

3.The earth resistance should accord to the national criterion.

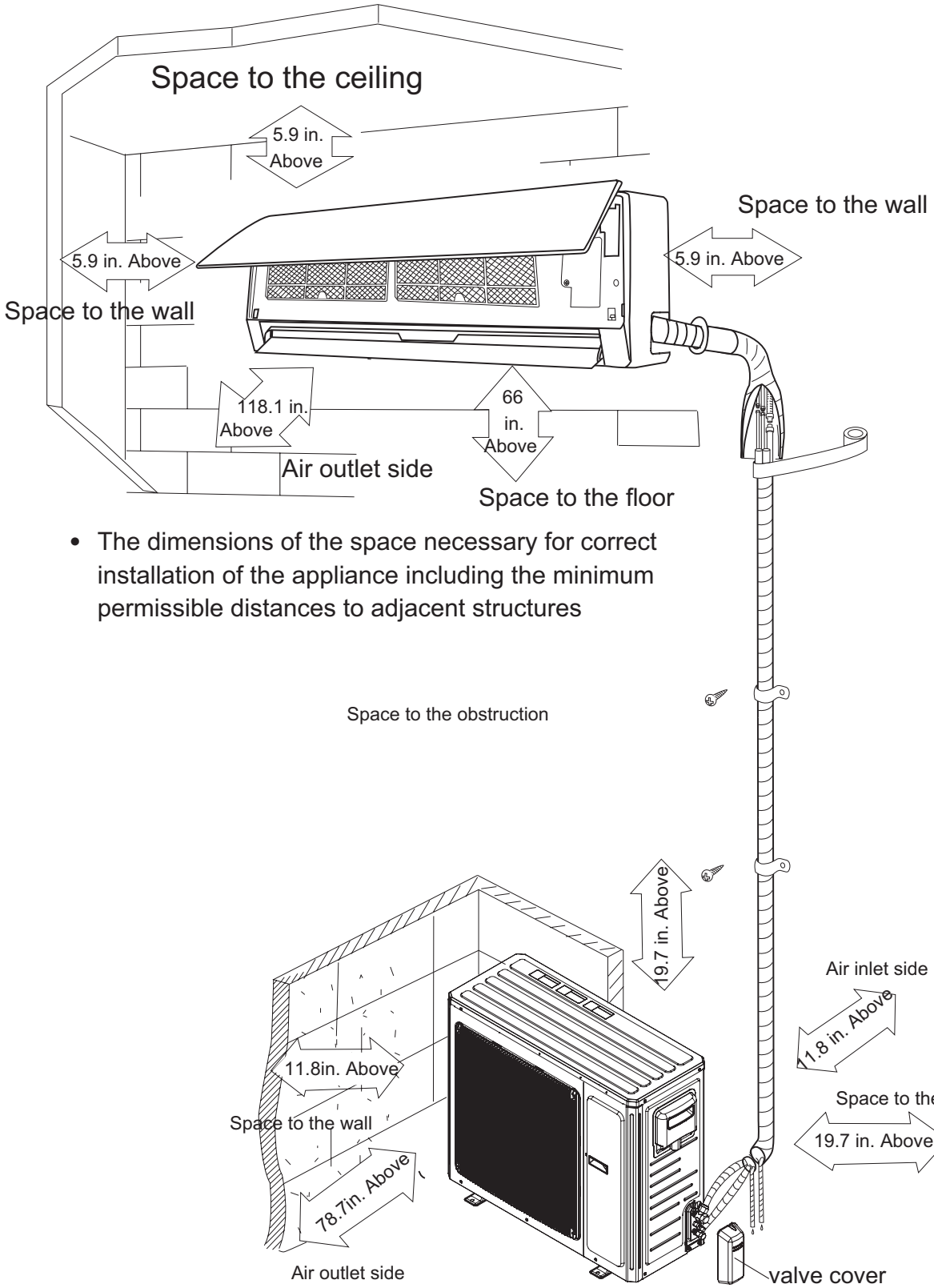
4.The power must have reliable earthing terminal. Please do not connect the earthing wire with the following:

① Water pipe ② Gas pipe ③ Contamination pipe

④ Other place that professional personnel consider is unreliable

5. The model and rated values of fuses should accord with the silk print on fuse cover or related PCB.

7.2 Installation Dimension Diagram



- The dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures

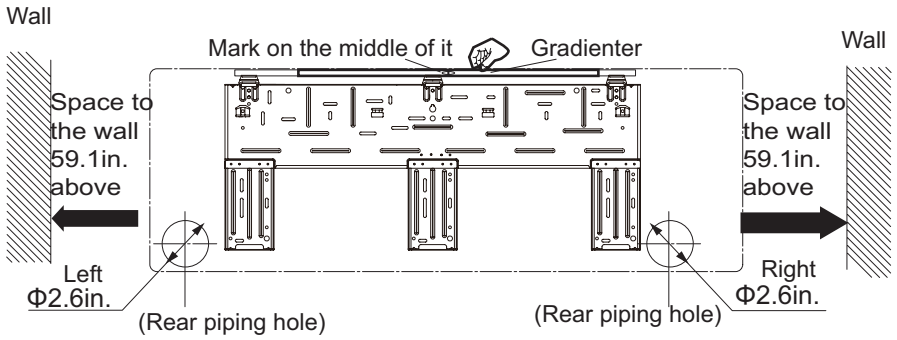
Schematic diagram being reference only (outdoor unit is with variation),

please refer to real product for authentic information.

7.3 Install Indoor Unit

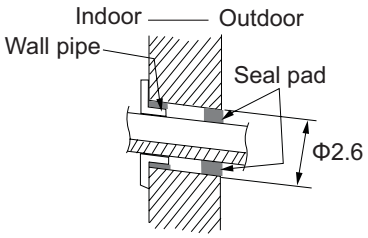
7.3.1 Installation of Mounting Plate

1. Mounting plate should be installed horizontally. As the water tray's outlet for the indoor unit is two-way type, during installation, the indoor unit should slightly slant to water tray's outlet for smooth drainage of condensate.
2.Fix the mounting plate on the wall with screws.
3.Be sure that the mounting plate has been fixed firmly enough to withstand about 132ib.. Meanwhile, the weight should be evenly shared by each screw.



7.3.2 Drill Piping Hole

1.Slant the piping hole (Φ2.6in.) on the wall slightly downward to the outdoor side.
2.Insert the piping-hole sleeve into the hole to prevent the connection piping and wiring from being damaged when passing through the hole.



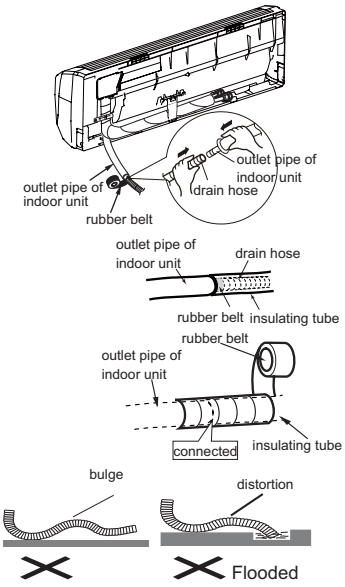
7.3.3 Installation of Drain Hose

1.Connect the drain hose to the outlet pipe of the indoor unit. Bind the joint with rubber belt.

2.Put the drain hose into insulating tube.

3.Wrap the insulating tube with wide rubber belt to prevent the shift of insulating tube. Slant the drain hose downward slightly for smooth drainage of condensate.

Note: The insulating tube should be connected reliably with the sleeve outside the outlet pipe. The drain hose should be slanted downward slightly, without distortion, bulge or fluctuation. Do not put the outlet in the water.



7.3.4 Connecting Indoor and Outdoor Electric Wires

1.Open the front panel.
2.Remove the wiring cover and wire clamp. Make the power connection cord pass through the hole at the back of indoor unit.(As shown in Fig.1)
3.Connect and fix the power connection cord to the terminal board. (As shown in Fig.2)
4.Fix the power connection cord with wire clamp and reinstall wiring cover.
5.Reinstall the front panel.

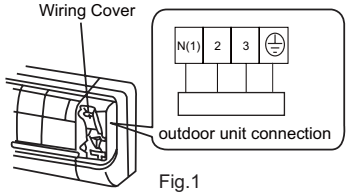


Fig.1

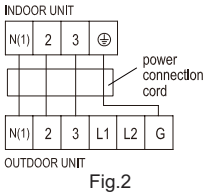


Fig.2

NOTE:

All wires between indoor and outdoor units must be connected by the qualified electric contractor.

- Electric wires must be connected correctly. Improper connection may cause malfunction.
- Tighten the terminal screws securely.
- After tightening the screws, pull the wire slightly to confirm whether it's firm or not.
- Make sure that the electric connections are earthed properly to prevent electric shock.
- Make sure that all wiring connections are secure and the cover plates are reinstalled properly. Poor installation may cause fire or electric shock.

7.3.5 Installation of Indoor Unit

●The piping can be output from right, right rear, left or left rear.

1.When routing the piping and wiring from the left or right side of indoor unit, cut off the tailings from the chassis when necessary(As shown in Fig.3)

(1)Cut off tailing 1 when routing the wiring only;

(2)Cut off tailing 1 and tailing 2 when routing both the wiring and piping.

2.Take out the piping from body case; wrap the piping, power cords, drain hose with the tape and then make them pass through the piping hole. (As shown in Fig.4)

3.Hang the mounting slots of the indoor unit on the upper hooks of the mounting plate and check if it is firm enough. (As shown in Fig.5)

4.The installation site should be 66 in. or more above the floor.

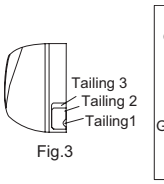


Fig.3

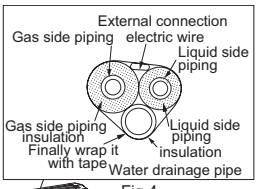


Fig.4

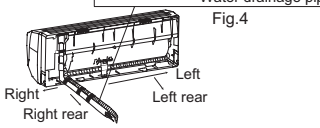


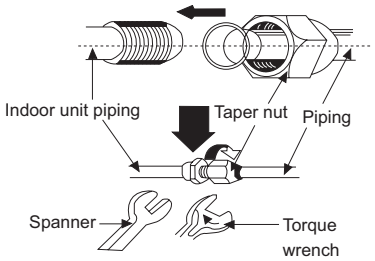
Fig.5

7.3.6 Installation of Connection Pipe

1.Align the center of the pipe flare with the related valve.

2.Screw in the flare nut by hand and then tighten the nut with spanner and torque wrench by referring to the following:

Tube diameter	Tightening torque,approximate(N·m)
Φ6.35(1/4”)	14～18N·m(140-180kgf.cm)
Φ9.52(3/8”)	34～42N·m(340-420kgf.cm)
Φ12.7(1/2”)	49～61N·m(490-610kgf.cm)
Φ15.88(5/8”)	68～82N·m(680-820kgf.cm)



NOTE: Connect the connection pipe to indoor unit at first and then to outdoor unit. Handle piping bending with care. Do not damage the connection pipe. Ensure that the joint nut is tightened firmly, otherwise, it may cause leakage.

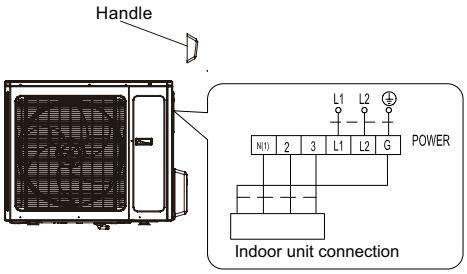
7.4 Install Outdoor Unit

7.4.1 Electric Wiring

1.Remove the handle on the right side plate of outdoor unit.

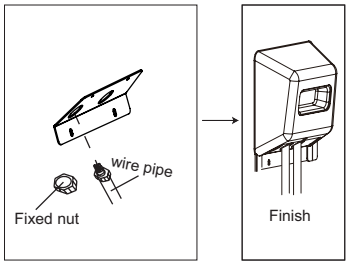
2.Insert the air butt terminal of power connection cord and power cord tightly and reliably by referring to the wiring diagram of outdoor unit. Finally, fix the power connection cord and power cord well with wire clamp.

3.Reinstall the handle.



NOTE:

- Wrong wiring may cause spare parts malfunction.
- After the cable fixed, make sure there should be a free space between the connection and connection and fixing place on the lead wire.
- The connecting wire and connection pipe cannnot touch each other.
- Top cover of outdoor unit and electric box assembly should be fixed by the screw. Otherwise, it can cause a fire, or short circuit caused by water or dust.



7.4.2 Air Purging and Leakage Test

1.Connect charging hose of manifold valve to charge end of low pressure valve (both high/low pressure valves must be tightly shut).
2.Connect joint of charging hose to vacuum pump.
3.Fully open the handle of Lo manifold valve.
4.Open the vacuum pump for vacuumization. At the beginning, slightly loosen joint nut of low pressure valve to check if there is air coming inside (If noise of vacuum pump has been changed, the reading of multimeter is 0). Then tighten the nut.
5.Keep vacuuming for more than 15mins and make sure the reading of multi-meter is -14.5PSI(-29.9in.Hg).
6. Fully open high/low pressure valves.
7. Remove charging hose from charging end of low pressure valve.
8. Tighten lid of low pressure valve. (As shown in Fig.6)

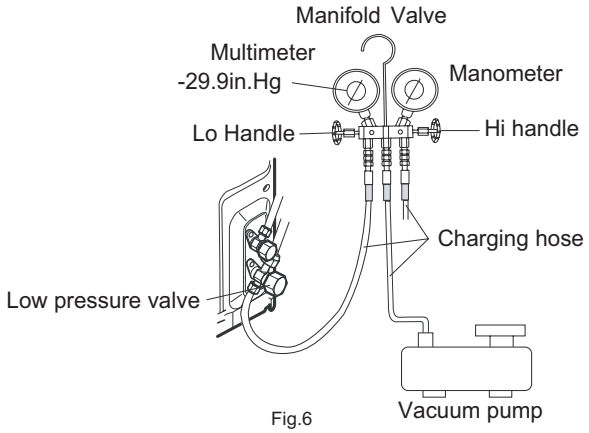
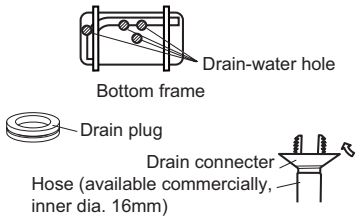


Fig.6

7.4.3 Outdoor Condensate Drainage (only for heat pump unit)

During heating operation, the condensate and defrosting water should be drained out reliably through the drain hose. Install the outdoor drain connector in a Φ9.8in. hole on the base plate and attach the drain hose to the connector so that the waste water formed in the outdoor unit can be drained out .The hole diameter 9.8in. must be plugged.
Whether to plug other holes will be determined by the dealers according to actual conditions.



7.5 Check after Installation and Operation Test

7.5.1 Check after Installation

Items to be checked	Possible malfunction
Has it been fixed firmly?	The unit may drop, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient cooling(heating) capacity
Is heat insulation sufficient?	It may cause condensation and dripping.
Is water drainage satisfactory?	It may cause condensation and dripping.
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunctionor damage the product.
Is the electric wiring and piping connection installed correctly and securely?	It may cause electric malfunction or damage the part.
Has the unit been connected to a secure earth connection?	It may cause electrical leakage.
Is the power cord specified?	It may cause electric malfunctionor damage the part.
Are the inlet and outlet openings blocked?	It may cause insufficient cooling(heating) capacity.
Is the length of connection pipes and refrigerant capacity been recorded?	The refrigerant capacity is not accurate.

7.5.2 Operation Test

1.Before Operation Test
(1)Do not switch on power before installation is finished completely.
(2)Electric wiring must be connected correctly and securely.
(3)Cut-off valves of the connection pipes should be opened.
(4)All the impurities such as scraps and thrums must be cleared from the unit.
2.Operation Test Method
(1)Switch on power and press "ON/OFF" button on the remote controller to start operation.
(2)Press MODE button to select the COOL, HEAT (Not available for cooling only unit), FAN to check whether the operation is normal or not.

7.6 Installation and Maintenance of Healthy Filter

7.6.1 Installation of Healthy Filter

1.Lift up the front panel from its two ends, as shown by the arrow direction, and then remove the air filter. (As shown in fig.a)

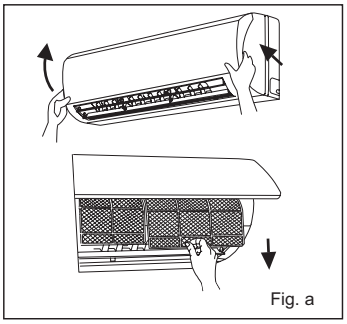


Fig. a

2.Attach the healthy filter onto the air filter. (as shown in fig.b)

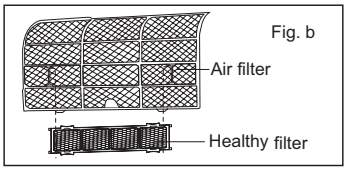


Fig. b

3.Install the air filter properly along the arrow direction in Fig.c, and then close the panel .

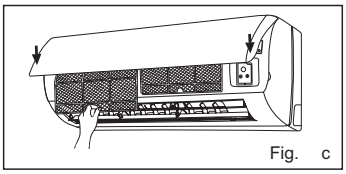


Fig. c

7.6.2 Cleaning and Maintenance

Remove the healthy filter and reinstall it after cleaning according to the installation instruction. Don't use brush or hard things to clean the filter. After cleaning, be sure to dry it in the shade.

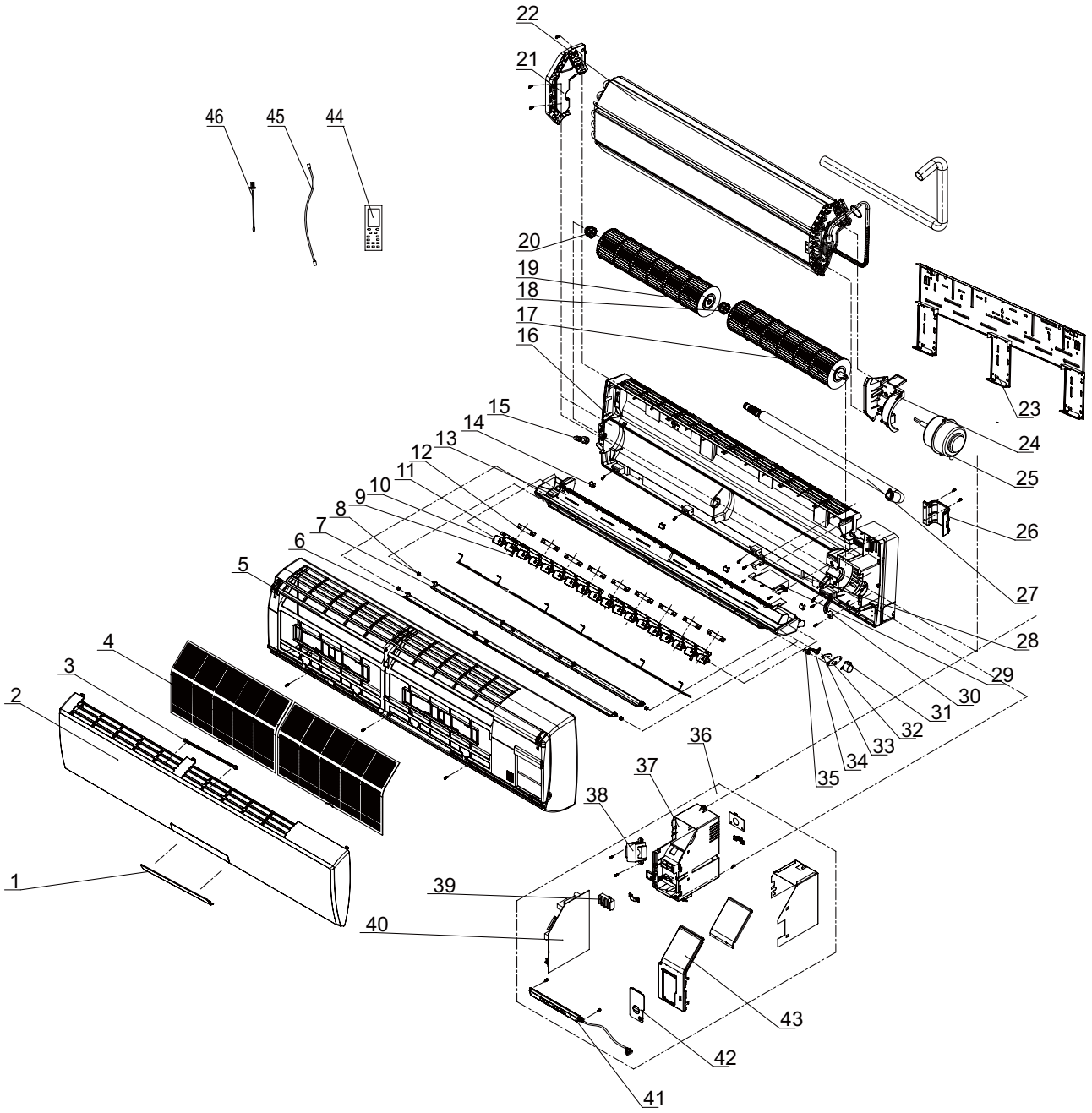
7.6.3 Service Life

The general serive life for the healthy filter is about one year under normal condition. As for silver ion filter, it is invalid when its surface becomes black (green).

●This supplementary instruction is provided for reference to the unit with healthy filter. If the graphics provided herein is different from the actual product, please refer to the atual product. The quantity of healthy filters is based on the actual delivery.

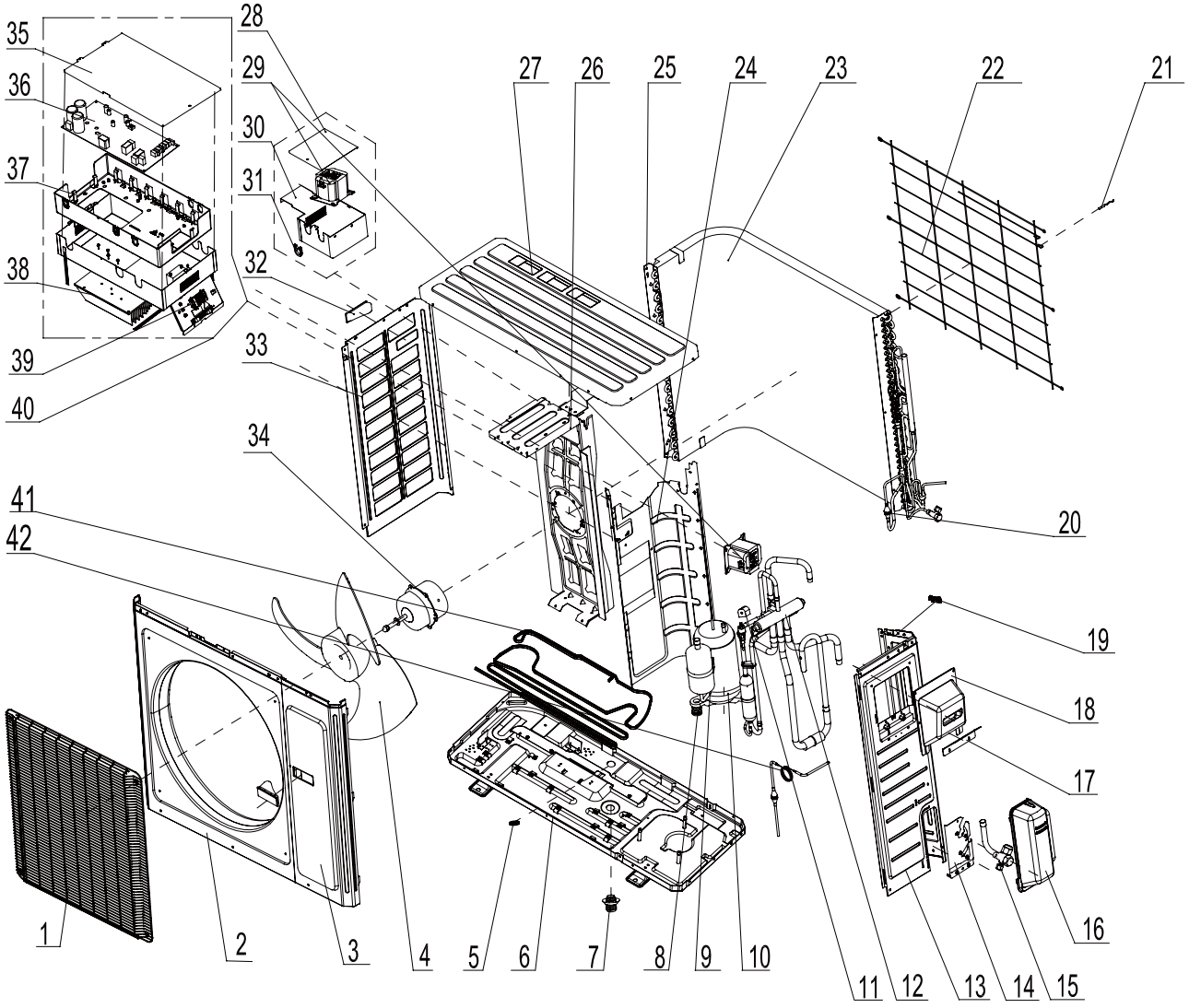
8. Exploded Views and Parts List

8.1 Indoor Unit



NO.	Description	Part Code	Qty
		A16EM4H4R36	
	Product Code	CB169N00300	
1	Receiver Window	22432164	1
2	Front Panel	20012490S	1
3	Stand bar	24212120	1
4	Filter Sub-Assy	11122106	2
5	Front Case Sub-Assy	20022159	1
6	Upper Guide Louver	10512166	1
7	Lower guide louver	10512167	1
8	Axile Bush	10542704	6
9	Air Louver 2	10512169	2
10	Air Louver 1	10512168	16
11	Connecting Rod	10582086	2
12	Louver Clamp	26112158	9
13	Water Tray	20182138	1
14	Screw Cover	242520053	4
15	Rubber Plug (Water Tray)	76712012	1
16	Rear Case Sub-Assy	22202166	1
17	Cross Flow Fan 1	10352039	1
18	Bearing Holder sub-assy	26152028	1
19	Cross Flow Fan 2	10352040	1
20	O-Gasket sub-assy of Bearing	76512051	1
21	Left Evaporator Support	24212041	1
22	Evaporator Assy	01002758	1
23	Wall Mounting Frame	01252398	1
24	Right Support of Evaporator	2421204201	1
25	Fan Motor	` 150121073	1
26	Pipe Clamp	26112071	1
27	Drainage hose	0523001404	1
28	Fixed Clip (evaporator)	02112009	1
29	Cover Plate	20122124	1
30	Motor Fixed Clip	26112069	1
31	Step Motor	1521210701	1
32	Press plate (crank)	26112070	1
33	Crank-guide	10582041	1
34	Upper Crank	10562004	1
35	Lower crank	10562005	1
36	Electric Box Assy	20202827	1
37	Electric Box	201022501	1
38	Transformer	43110258	1
39	Terminal Board	42011233	1
40	Main Board	30138696	1
41	Display Board	30565087	1
42	Electric Box Cover	20102252	1
43	Electric Box Cover	2011204402S	1
44	Remote Controller	305100621	1
45	Tube Sensor	390000591	1
46	Ambient Temperature Sensor	390000451	1

The data above are subject to change without notice.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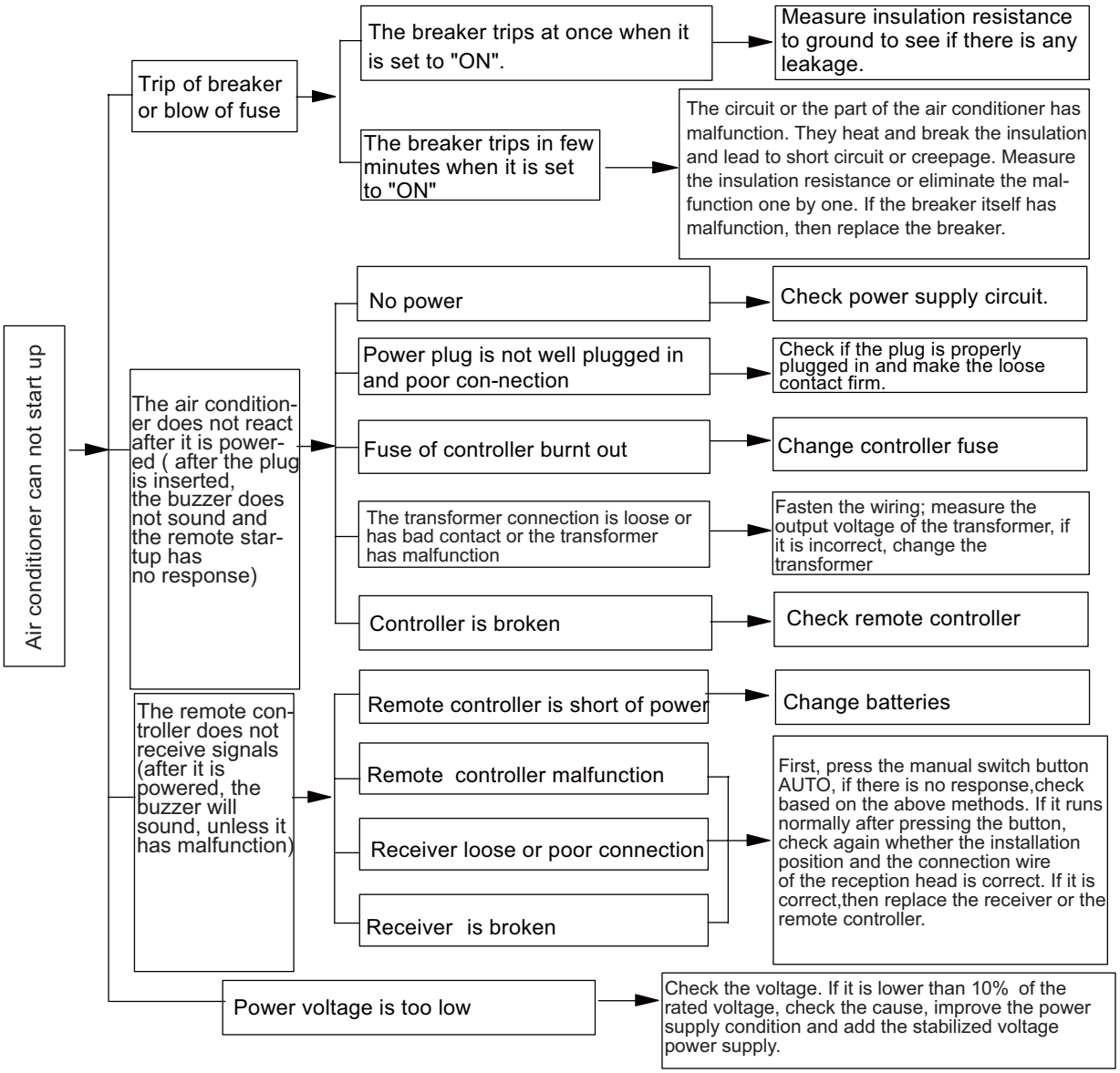
NO.	Description	Part Code	Qty
		A16CI4H4R36	
	Product Code	CB169W00300	
1	Front Grill	01473050	1
2	Cabinet	0143500401P	1
3	Front Side Plate	01305086P	1
4	Axial Flow Fan	10335005	1
5	Drainage Plug	06813401	3
6	Chassis Sub-assy	01203880P	1
7	Drainage Connecter	06123401	1
8	Compressor Gasket	76815218	3
9	Compressor and fittings	00205275	1
10	electrical heater	7651873209	1
11	Magnet Coil	4300040029	1
12	4-way Valve Assy	03123656	1
13	Right Side Plate	0130504402P	1
14	Valve Support Sub-Assy	0171501201P	1
15	Cut-off Valve	07133157	1
16	Valve cover	22245003	1
17	Retaining plate	02115006P	1
18	Handle assy	02113109	1
19	Wiring clamp	26115004	1
20	Capillary Sub-Assy	03063545	1
21	Temperature Sensor	3900031001	1
22	Rear Grill	01475013	1
23	Condenser Assy	01163059	1
24	Clapboard	01233134	1
25	Condenser support plate	01175037	1
26	Motor Support Sub-Assy	01802876	1
27	Top Cover Sub-Assy	01255007	1
28	Electric Box Cover	01425279	1
29	Reactor	43130192	2
30	Electric Box Sub-Assy	02603620	1
31	Pass wire ring sub-assy	76614102	2
32	left handle	26235401	2
33	Left Side Plate	01305043P	1
34	Fan Motor	1570280205	1
35	Electric Box Cover	01425281	1
36	Main Board	30138214	1
37	Electric Box	02603614	1
38	Radiator	49013046	1
39	Terminal Board	42010255	1
40	Electric Box Assy	02603612	1
41	Capillary sub- assy(oil returning)	03063836	1
42	Electrical Heater (Chassis)	/	1

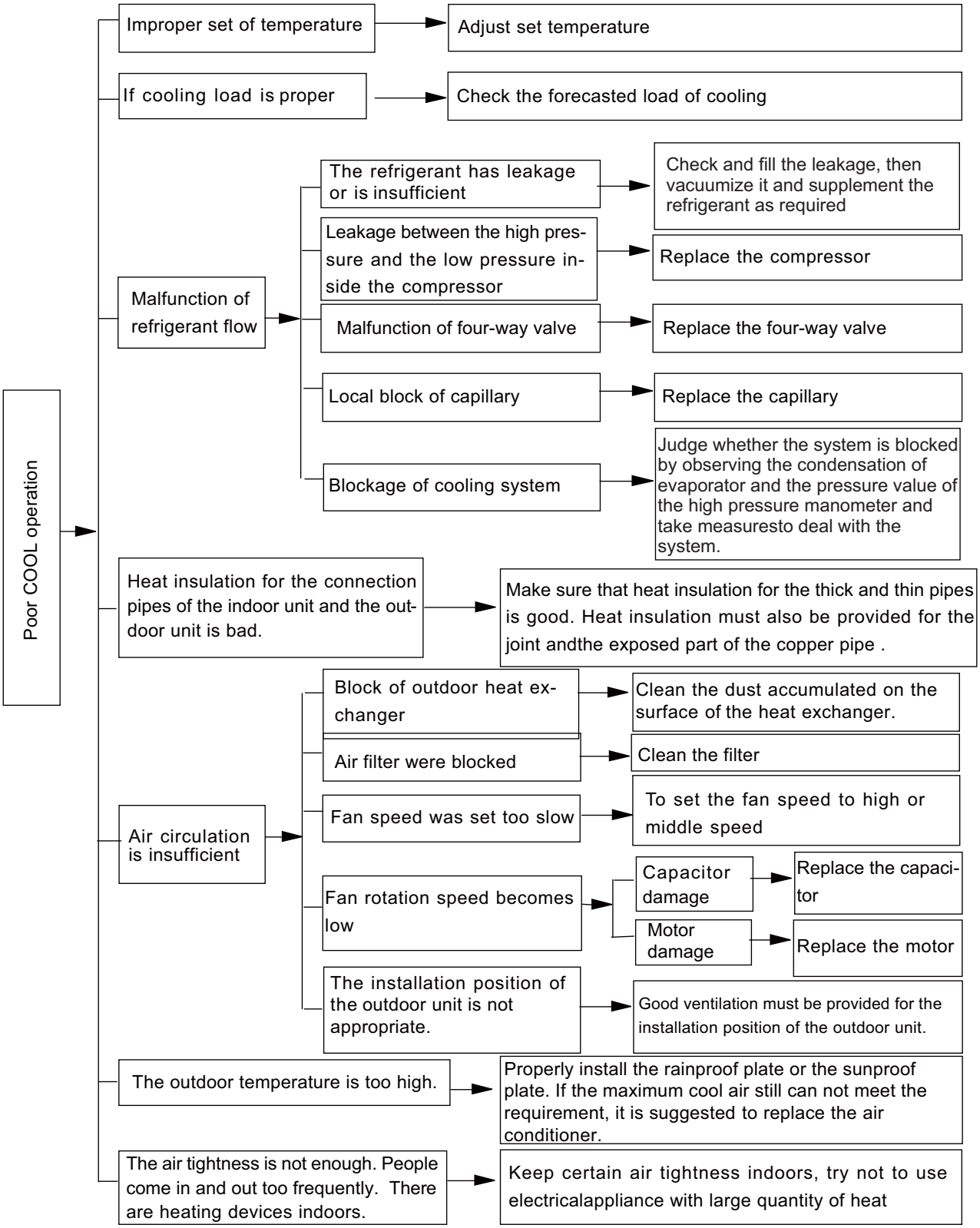
The data above are subject to change without notice.

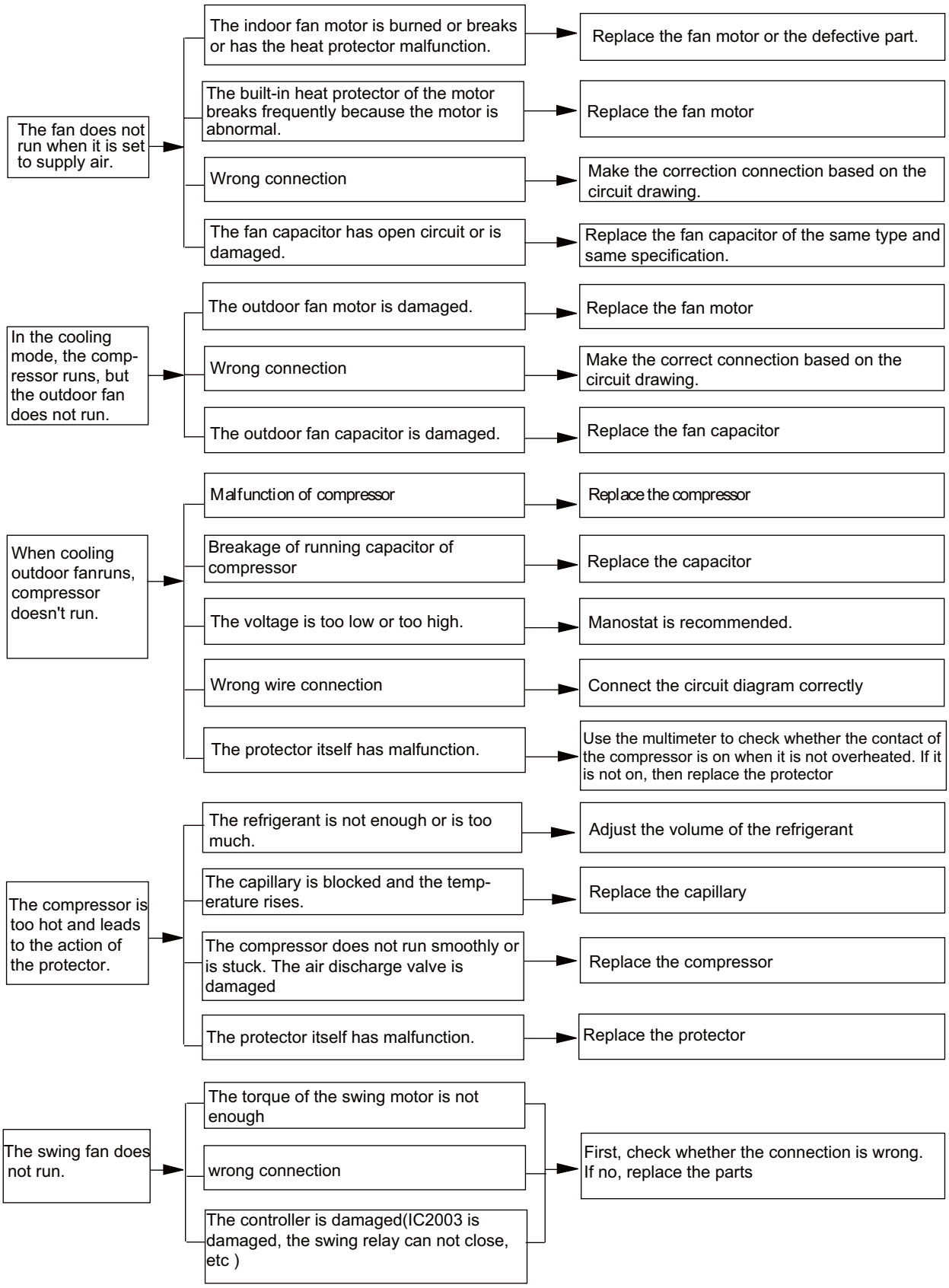
9. Troubleshooting

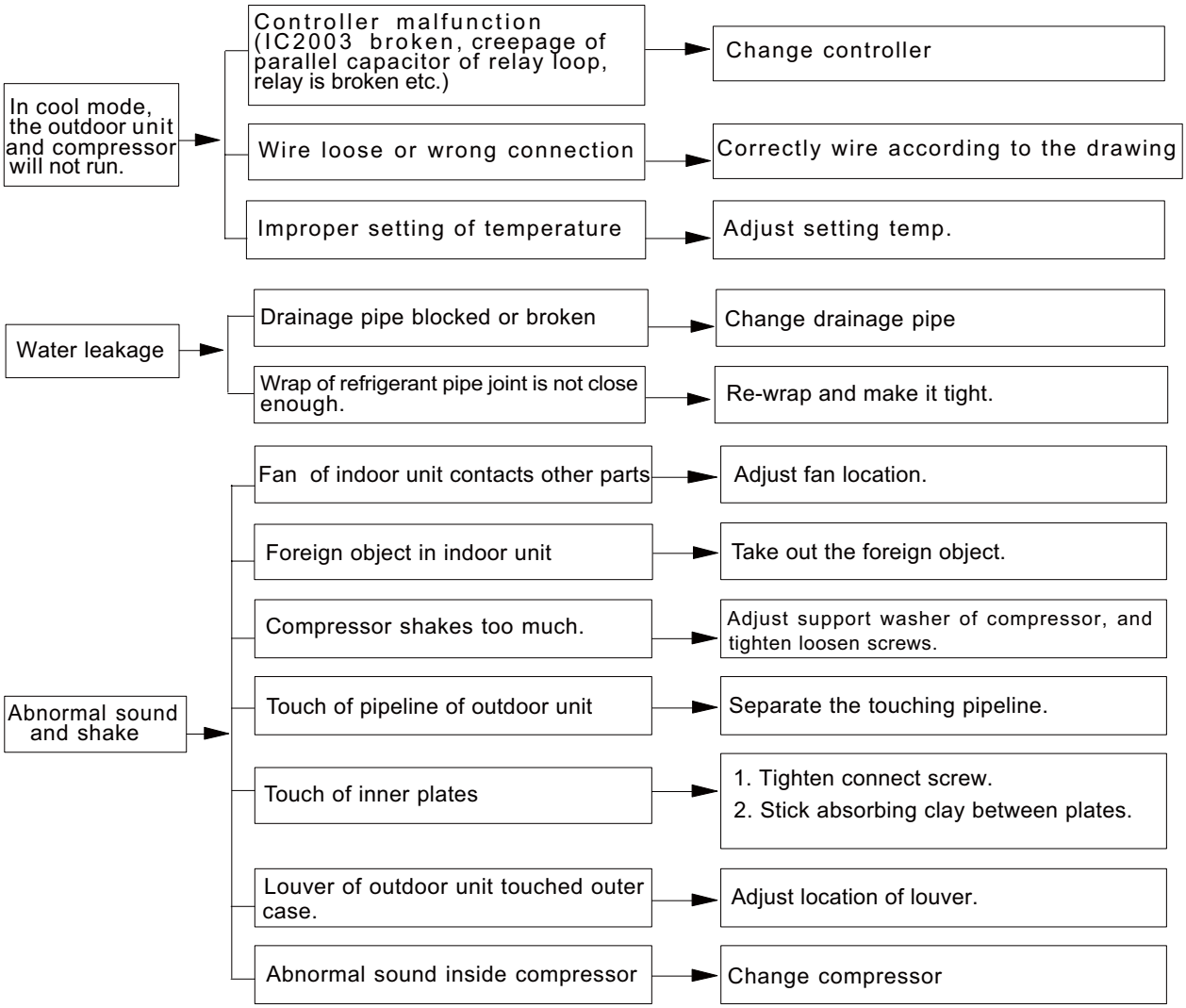
9.1 Malfunction Analysis

Note: When replacing the controller, make sure insert the wire jumper into the new controller, otherwise the unit will display C5




Poor COOL operation
Improper set of temperature
Adjust set temperature
If cooling load is proper
Check the forecasted load of cooling
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four-way valve
Replace the four-way valve
Local block of capillary
Replace the capillary
Blockage of cooling system
Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measuresto deal with the system.
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint andthe exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
To set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation position of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
The air tightness is not enough. People come in and out too frequently. There are heating devices indoors.
Keep certain air tightness indoors, try not to use electricalappliance with large quantity of heat

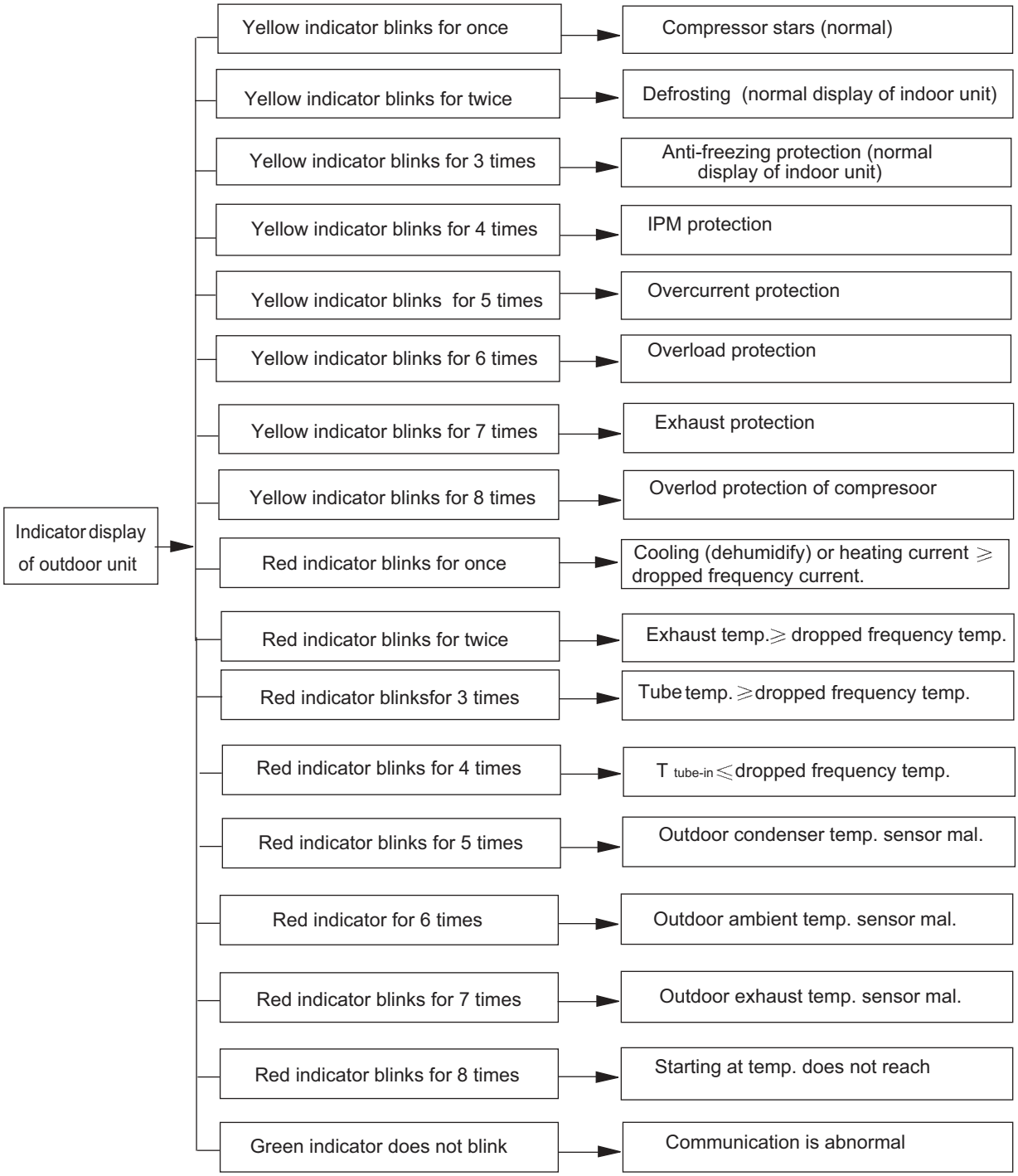

The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing.
The outdoor fan capacitor is damaged.
Replace the fan capacitor
When cooling outdoor fanruns, compressor doesn't run.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temperature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector
The swing fan does not run.
The torque of the swing motor is not enough
wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts


In cool mode, the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.
Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts
Adjust fan location.
Foreign object in indoor unit
Take out the foreign object.
Compressor shakes too much.
Adjust support washer of compressor, and tighten loosen screws.
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor

9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

Name of malfunction	Display of indoor unit	State of the lamps on the outdoor unit PCB			
	ERROR CODE	YELLOW	RED	GREEN	Reasons
Compressor running (normal)		blink-1 times			Normal
Automatic defrosting (normal)	H1	blink-2 times			Normal
Anti-freezing protection	E2	blink-3 times			Refrigerant leakage、indoor unit air flow blocked up、filter duty
Stop for IPM module protection (over current)	H5	blink-4 times			IPM moudel over current、outdoor unit air flow blocked up
Stop for over current protection	E5	blink-5 times			Outdoor unit over current、ambient temperature is abominable
Overload protection	H4	blink-6 times			Ambient temperature is abominable 、heat exchanger blocked up
Stop for exhaust protection	E4	blink-7 times			Less refrigerant、capillary blocked up、ambient temperature is abominable
Stop for compressor overload protection	H3	blink-8 times			Compressor shell over heat、less refrigerant、capillary blocked up
Stop for over power protection	L9	blink-9 times			Ambient temperature is abominable
Stop for IPM module protection (over heat)	H5	blink-10 times			IPM moudel over heat、outdoor unit air flow blocked up
Stop for EEPROM read-write malfunction	EE	blink-11 times			The EEPROM on the outdoor PCB mainboard can not read or write
Stop for low voltage protection	PL	blink-12 times			DC voltage is too low.
Stop for high voltage protection	PH	blink-13 times			DC voltage is too high.
Stop for PFC circuit over current protection	HC	blink-14 times			The PFC circuit over current
No feedback of indoor fan motor	H6				indoor fan is abnormal
Stop for ID and OD doesn't match	LP	blink-16 times			The indoor unit and outdoor unit doesn't match
Compressor frequence limit by over current protection			blink-1 times		Outdoor unit over current、ambient temperature is abominable
Compressor frequence limit by exhaust protection			blink-2 times		Less refrigerant、capillary blocked up、ambient temperature is abominable
Compressor frequence limit by over load protection			blink-3 times		Ambient temperature is abominable 、heat exchanger blocked up
Compressor frequence limit by anti-freezing protection			blink-4 times		Refrigerant leakage、indoor unit air flow blocked up、filter duty
Outdoor pipe temperature sensor malfunction	F4		blink-5 times		Circuit-open or circuit-short for outdoor condenser pipe temp. sensor
Outdoor ambient temperature sensor malfunction	F3		blink-6 times		Circuit-open or circuit-short for outdoor environment temp. sensor
Outdoor exhaust temperature sensor malfunction	F5		blink-7 times		Circuit-open or circuit-short for outdoor gas-discharge pipe temp. sensor
The indoor temp. reach to operate compressor (nomal)			blink-8 times		Nomal,compressor prepare to running
Compressor frequence limit by IPM protection			blink-11 times		IPM moudel over heat、outdoor unit air flow blocked up
Compressor frequence limit by over power protection			blink-13 times		Ambient temperature is abominable
Indoor ambient temperature sensor malfunction	F1				Circuit-open or circuit-short for indoor environment temp. sensor
Indoor tube temperature sensor malfunction	F2				Circuit-open or circuit-short for indoor evaporator pipe temp. sensor
Stop for communication malfunction	E6			off	Communication line failure、main PCB failure、interfere source、connect line wrong
Communication normal				blink-1 times	Communication is normal
Jumper cap malfunction protection	C5				The jumper misfit the main board
No feedback of outdoor fan motor			blink-14 times		
High-preesure Protection	E1		blink-16 times		
Remark: The lamps blink 0.5s on, 0.5s off,between two error cycle,it will be 2s off interval .					

If malfunction occurs,corresponding code will display and the unit will resume normal until protection or malfunction disappears.



Analysis or processing of some of the malfunction display:

1. Compressor discharge protection

Possible reasons: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser;the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible reason: Sudden drop of supply voltage.

3. Communic ation malfun ction

Processing method: Check if communic ation signal cable is connected reliably.

4. Sensor open or short circuit

Processing method: Check whethers ensor is normal, connected with the corre sponding position on the controller and if damage of lead wire is found.

5. Compressor over load protection

Possible reasons: insufficient or too much refrigrant; blockage of capillary an dincrease of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrige rant amount; replace the capillary; replace the compressor; use univers al meter to check if the contactor of compress or is fine when it is not over heated, if not replace the protector.

6. System malfun ction

Overload protection.When tube temperature(Check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protection will beactivated.

Possible reasons: Outdoor tempera ture is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.

Please refer to the malfunction analysis in the previous section for handling method .

7. IPM module protection

Processing method:Once the module malfunction happens,if it persists for a long time and can not be self-canceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.

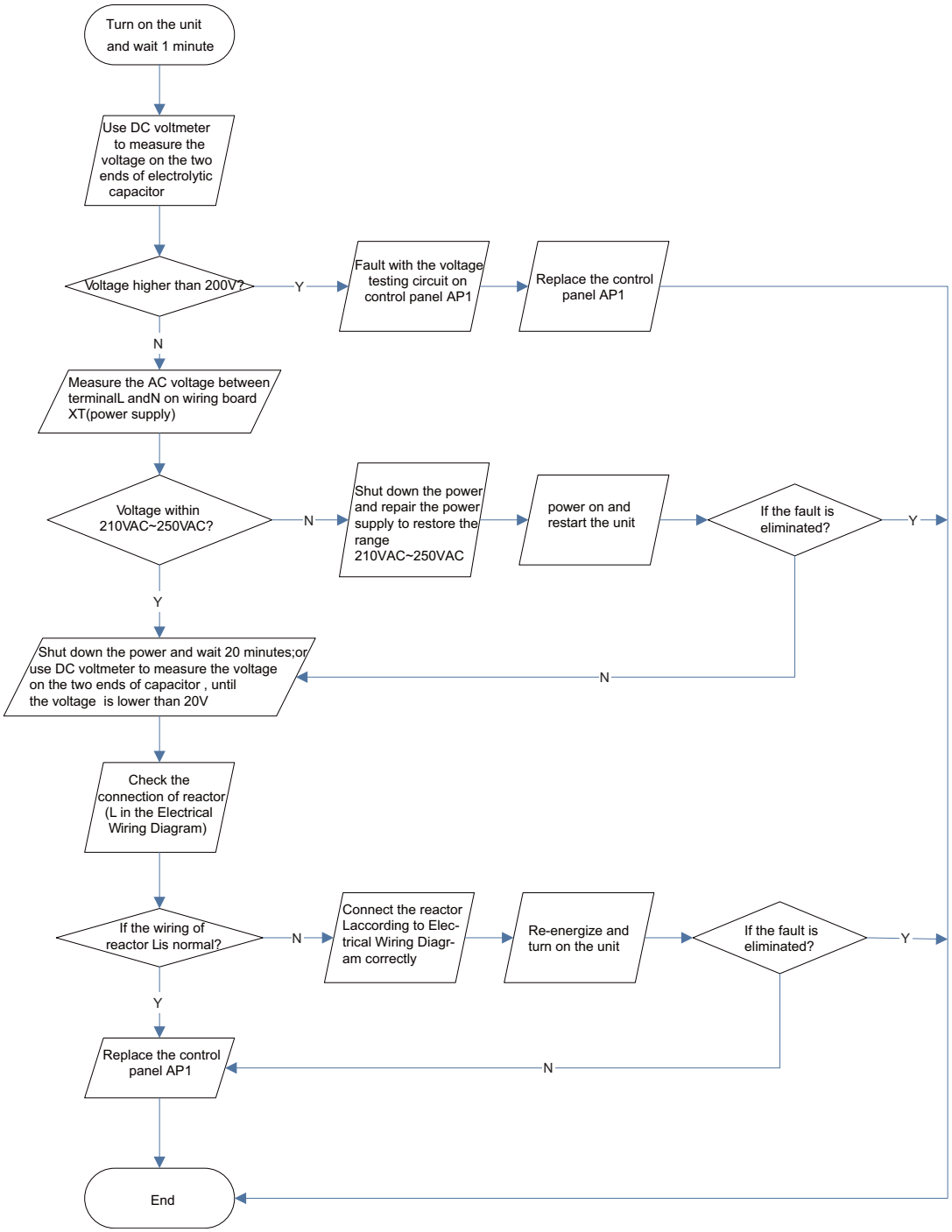
9.3 How to Check Simply the Main Part

(1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:

- Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC~240VAC.
- If the reactor (L) is correctly connected? If the connection is loose or fallen? If the reactor (L) is damaged?

Fault diagnosis process:

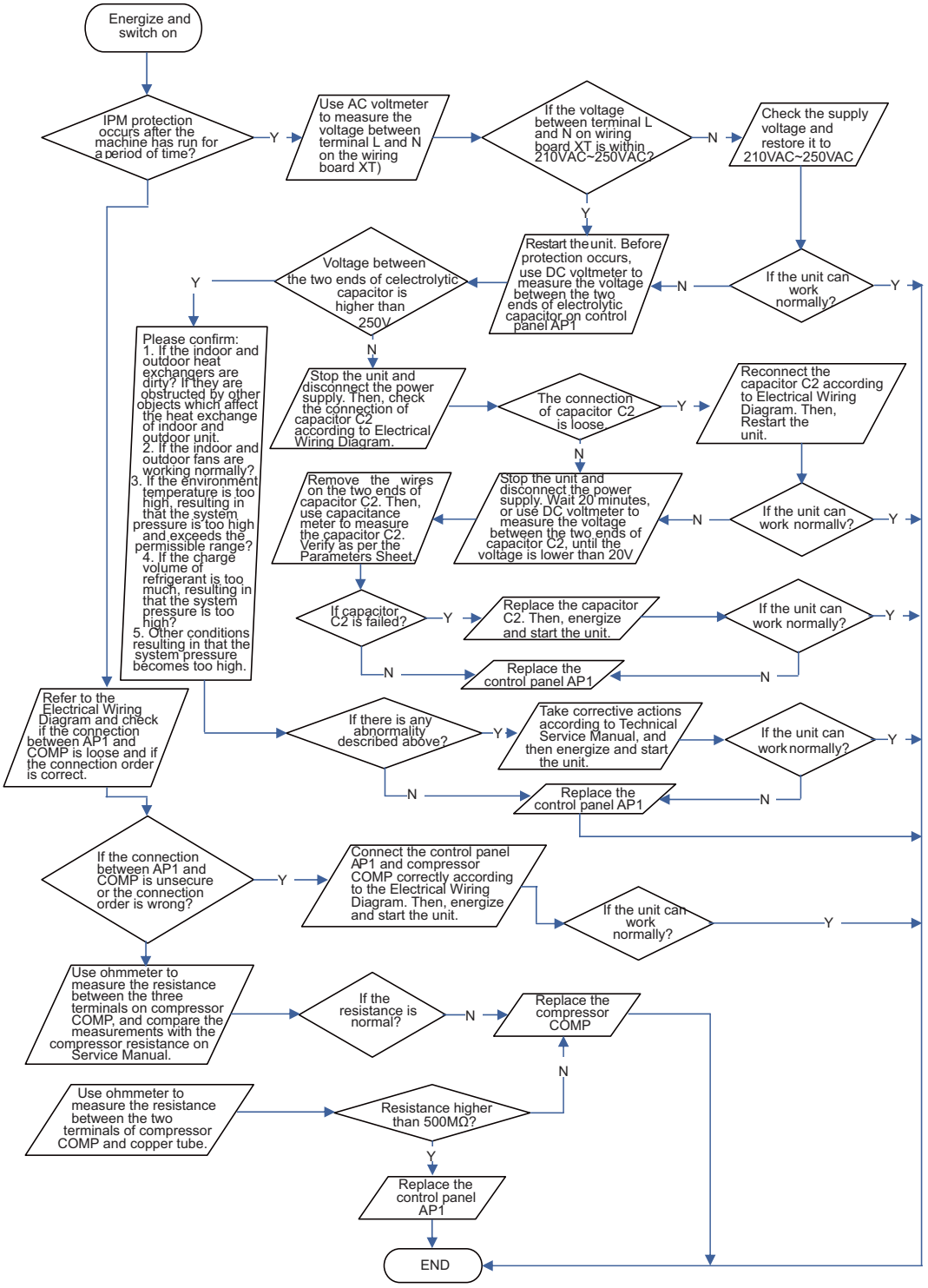


(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

- If the connection between control panel AP1 and compressor COMP is secure? If loose? If the connection is in correct order?
- If the voltage input of the machine is within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
- If the compressor coil resistance is normal? If the insulation of compressor coil against the copper tube is in good condition?
- If the working load of the machine are too high? If the radiation is good?
- If the charge volume of refrigerant is correct?

Fault diagnosis process:

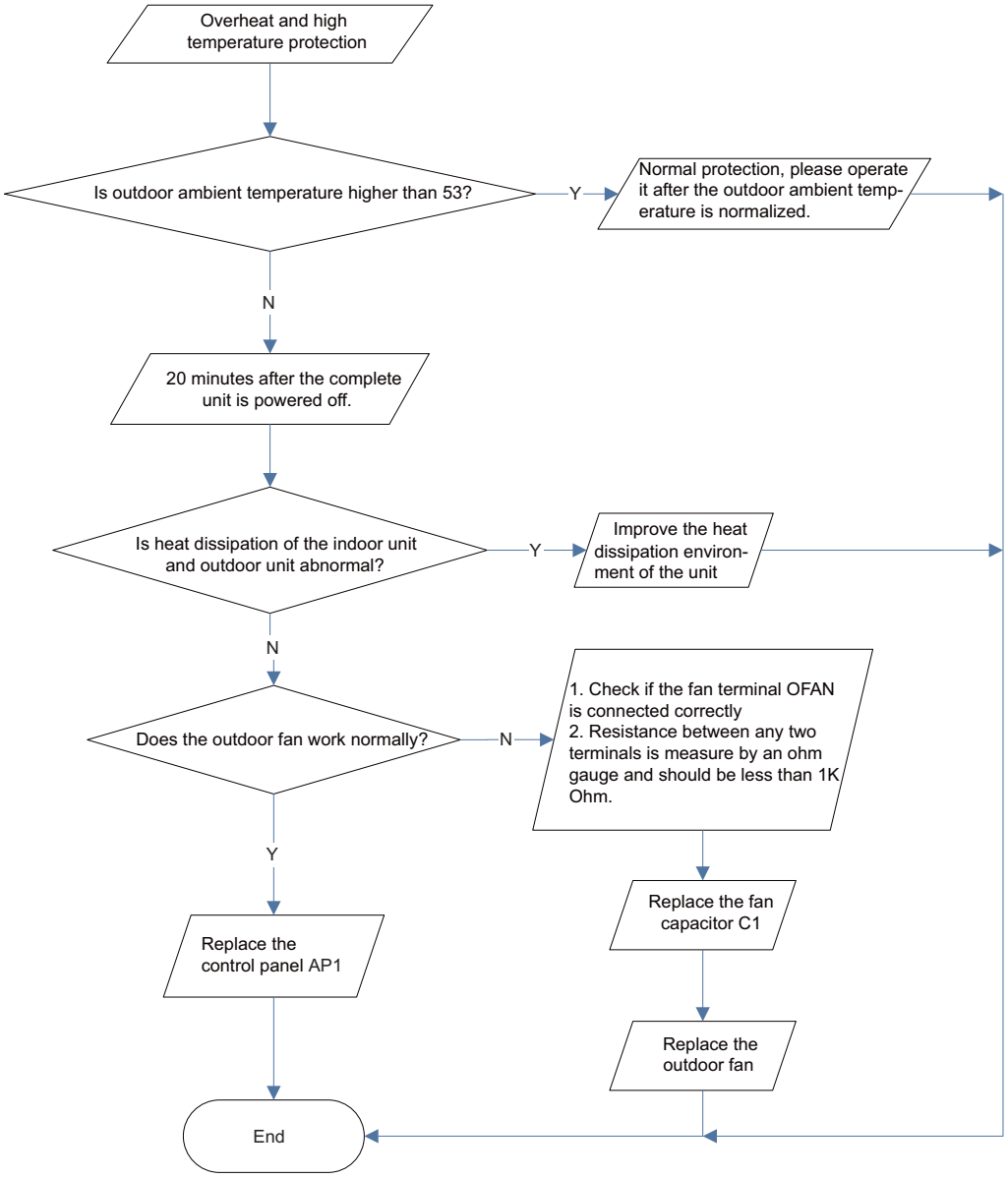


(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Is outdoor ambient temperature in normal range?
- Are the outdoor and indoor fans operating normally?
- Is the heat dissipation environment inside and outside the unit is good?

Fault diagnosis process:

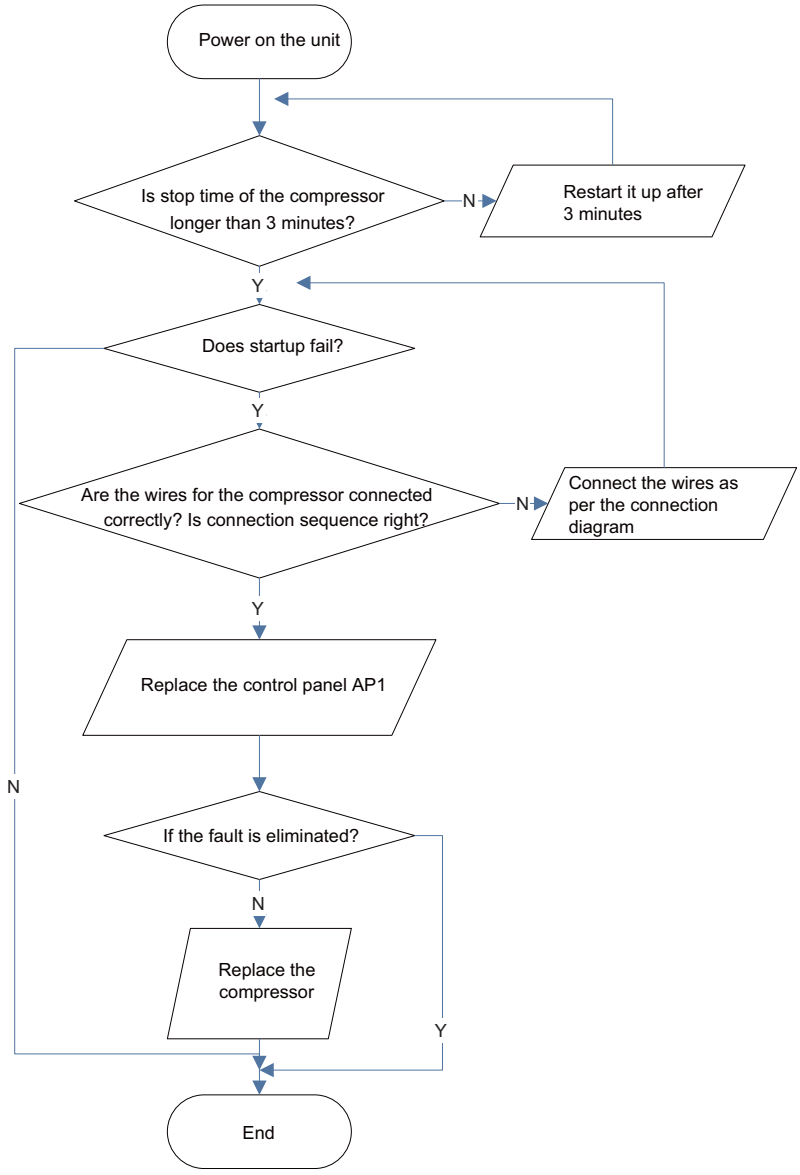


(4) Start-up failure (following AP1 for outdoor unit control board)

Mainly detect:

- Whether the compressor wiring is connected correct?
- Is compressor broken?
- Is time for compressor stopping enough?

Fault diagnosis process:

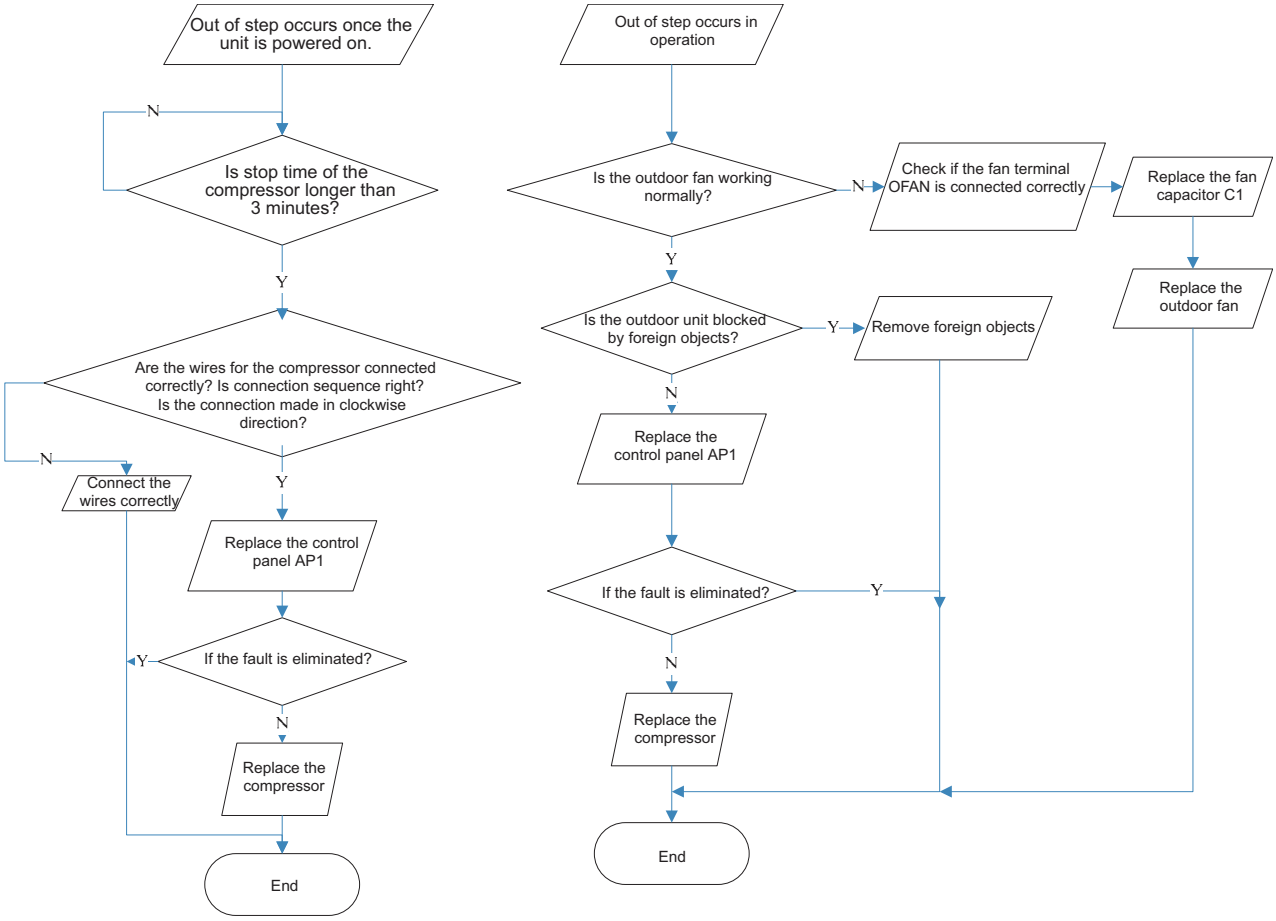


(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Whether the system pressure is too high?
- Whether the input voltage is too low?

Fault diagnosis process:

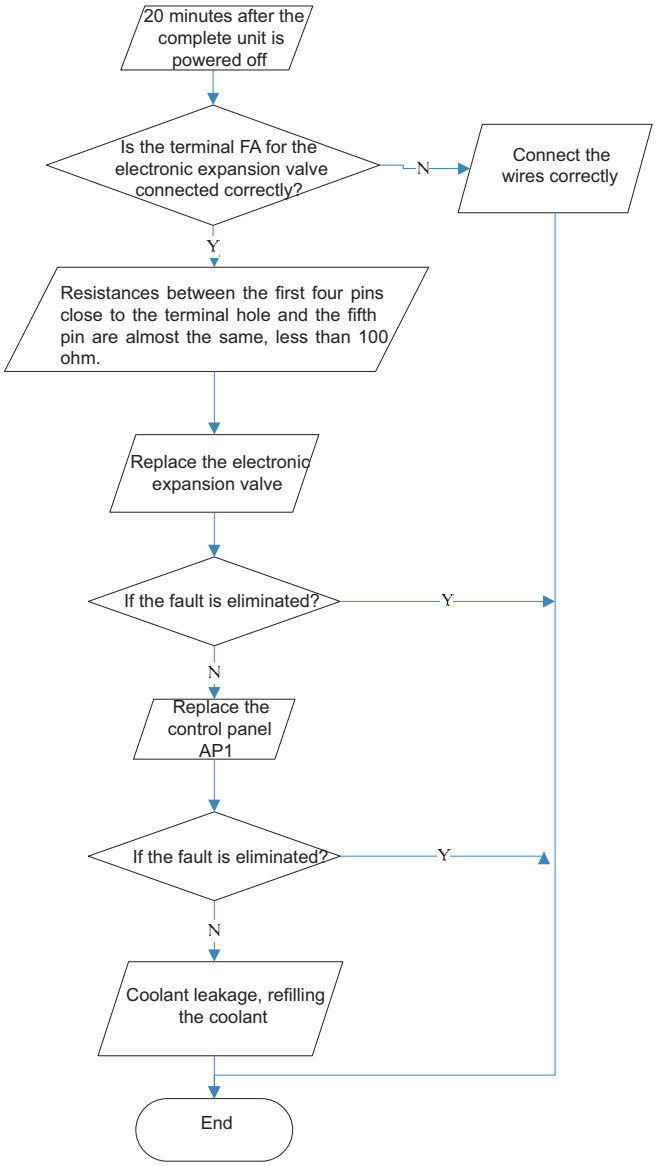


(6)Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

- Wether the PMV is connected well or not? Is PMV damaged?
- Is refrigerant leaked?

Fault diagnosis process:

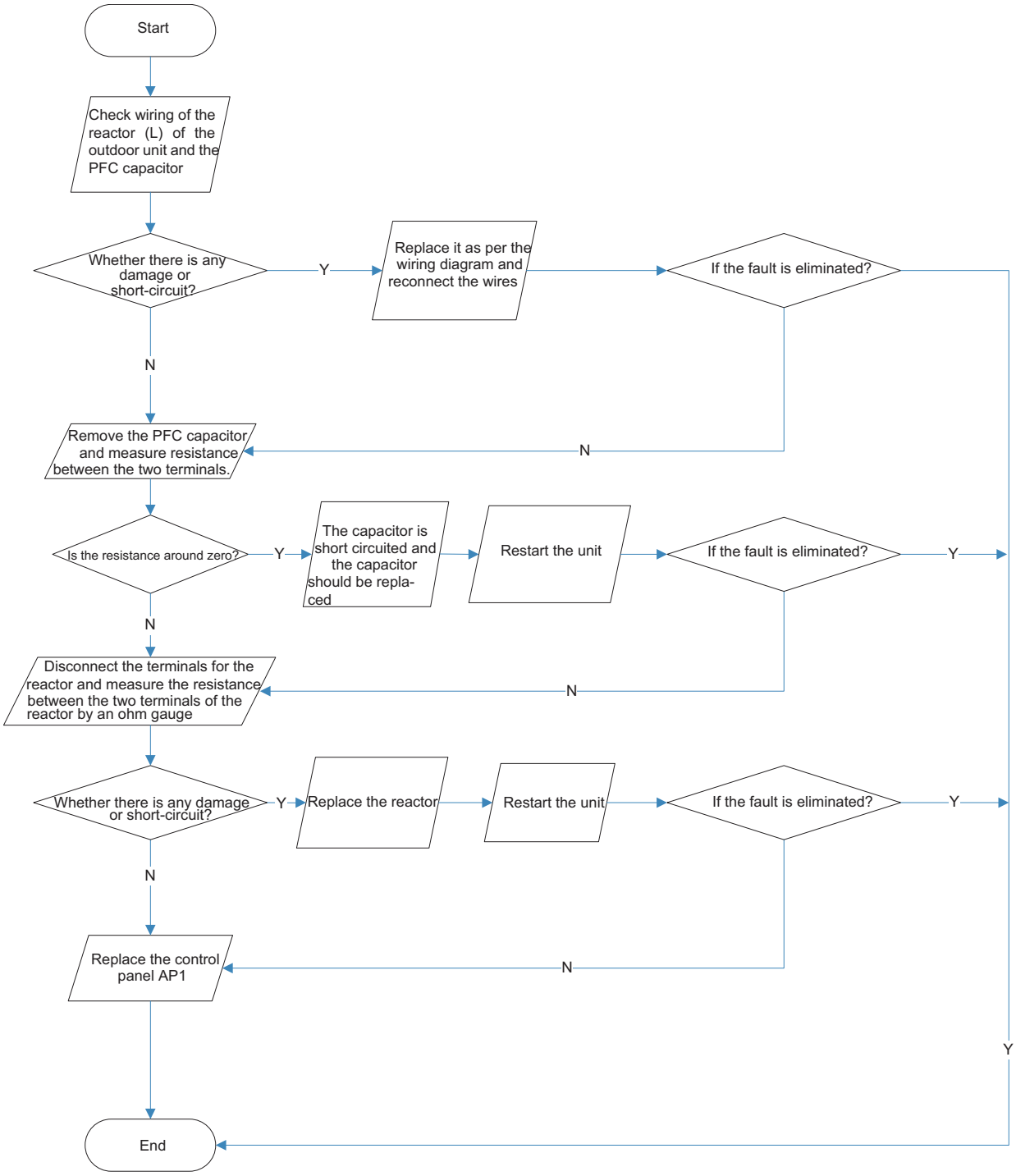


(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

● Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:



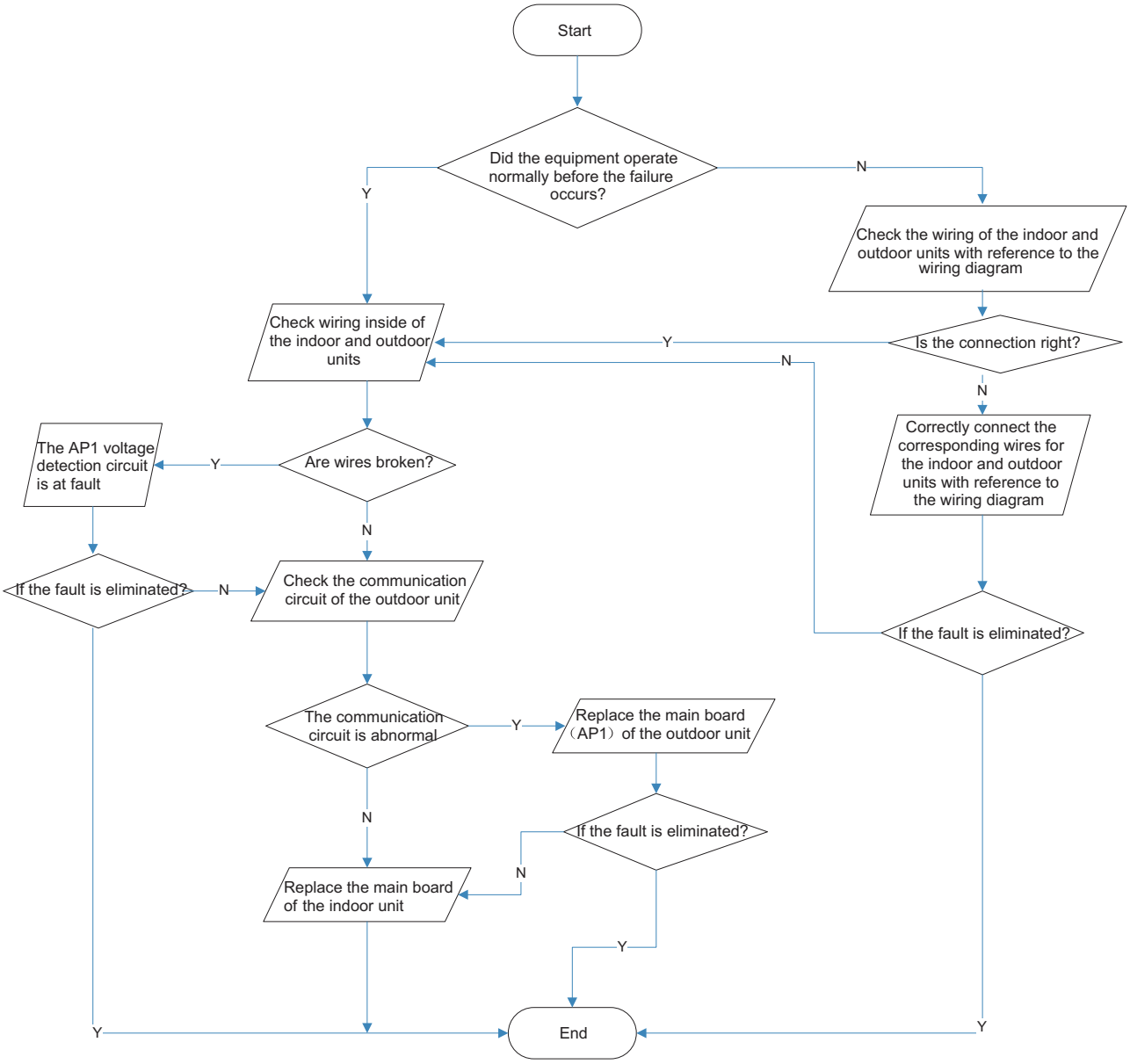
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

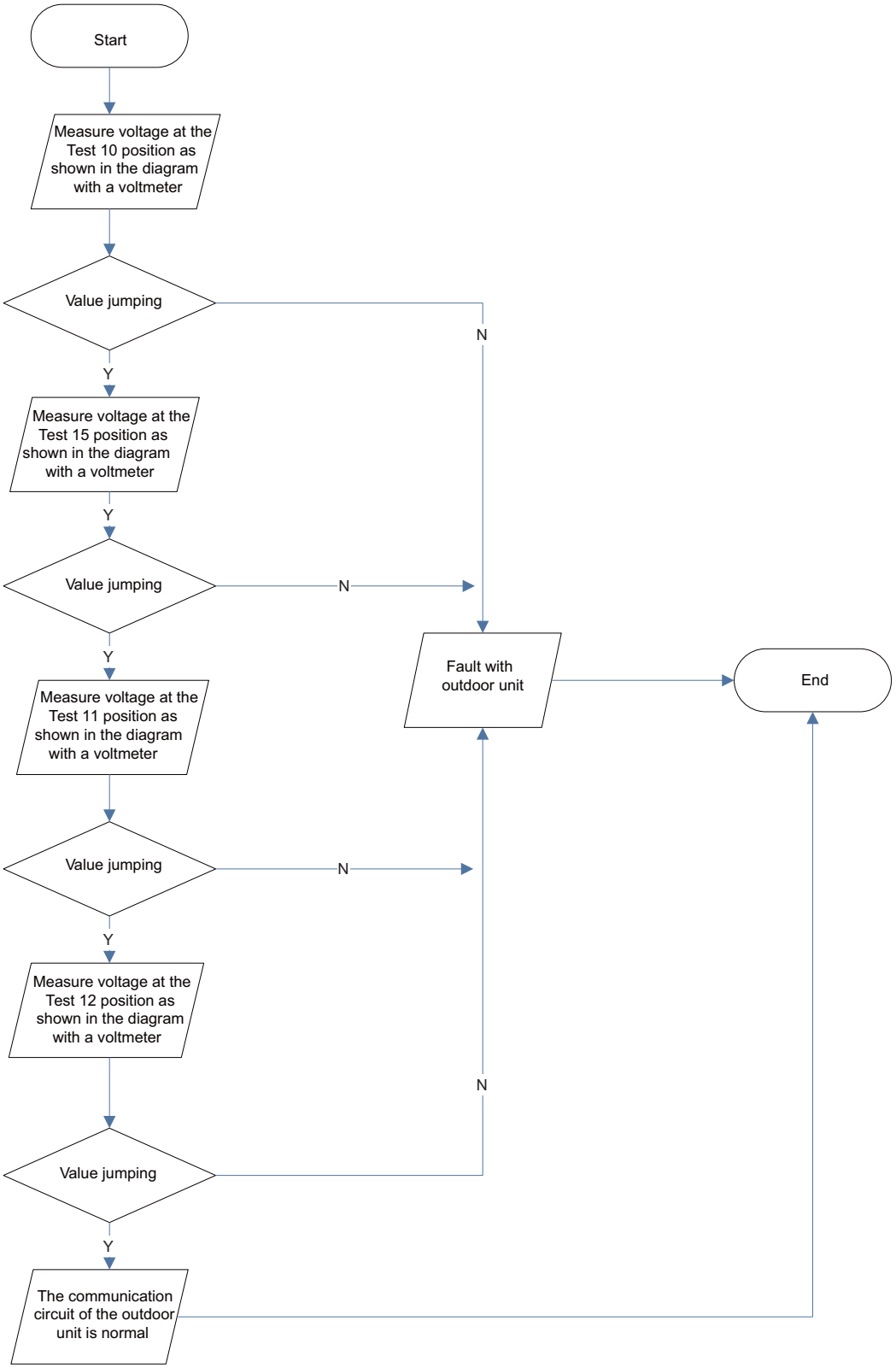
● Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

● Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

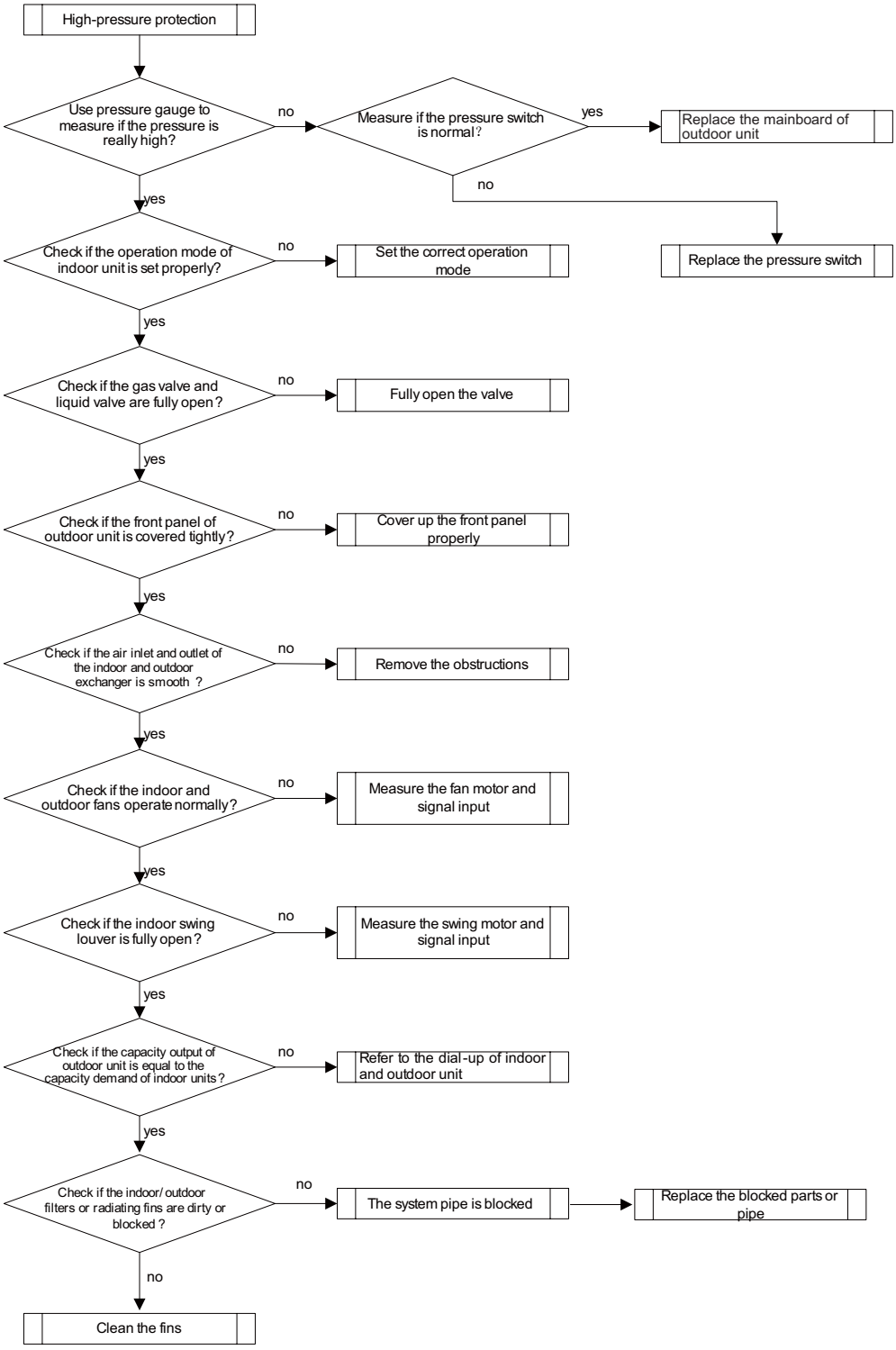
Fault diagnosis process:



(9) Flow chart for outdoor communitcation circuit detecting:



(10) High-pressure Protection



Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

Temp.（˚F）	Resistance（kΩ）	Temp.（˚F）	Resistance（kΩ）	Temp.（˚F ）	Resistance（kΩ）	Temp.（˚F）	Resistance（kΩ）
-2.2	138.1	68	18.75	138.2	3.848	208.4	1.071
-0.4	128.6	69.8	17.93	140	3.711	210.2	1.039
1.4	121.6	71.6	17.14	141.8	3.579	212	1.009
3.2	115	73.4	16.39	143.6	3.454	213.8	0.98
5	108.7	75.2	15.68	145.4	3.333	215.6	0.952
6.8	102.9	77	15	147.2	3.217	217.4	0.925
8.6	97.4	78.8	14.36	149	3.105	219.2	0.898
10.4	92.22	80.6	13.74	150.8	2.998	221	0.873
12.2	87.35	82.4	13.16	152.6	2.896	222.8	0.848
14	82.75	84.2	12.6	154.4	2.797	224.6	0.825
15.8	78.43	86	12.07	156.2	2.702	226.4	0.802
17.6	74.35	87.8	11.57	158	2.611	228.2	0.779
19.4	70.5	89.6	11.09	159.8	2.523	230	0.758
21.2	66.88	91.4	10.63	161.6	2.439	231.8	0.737
23	63.46	93.2	10.2	163.4	2.358	233.6	0.717
24.8	60.23	95	9.779	165.2	2.28	235.4	0.697
26.6	57.18	96.8	9.382	167	2.206	237.2	0.678
28.4	54.31	98.6	9.003	168.8	2.133	239	0.66
30.2	51.59	100.4	8.642	170.6	2.064	241	0.642
32	49.02	102.2	8.297	172.4	1.997	242.8	0.625
33.8	46.6	104	7.967	174.2	1.933	244.6	0.608
35.6	44.31	105.8	7.653	176	1.871	246.4	0.592
37.4	42.14	107.6	7.352	177.8	1.811	248.2	0.577
39.2	40.09	109.4	7.065	179.6	1.754	250	0.561
41	38.15	111.2	6.791	181.4	1.699	251.8	0.547
42.8	36.32	113	6.529	183.2	1.645	253.6	0.532
44.6	34.58	114.8	6.278	185	1.594	255.4	0.519
46.4	32.94	116.6	6.038	186.8	1.544	257.2	0.505
48.2	31.38	118.4	5.809	188.6	1.497	259	0.492
50	29.9	120.2	5.589	190.4	1.451	260.8	0.48
51.8	28.51	122	5.379	192.2	1.408	262.6	0.467
53.6	27.18	123.8	5.197	194	1.363	264.4	0.456
55.4	25.92	125.6	4.986	195.8	1.322	266.2	0.444
57.2	24.73	127.4	4.802	197.6	1.282	268	0.433
59	23.6	129.2	4.625	199.4	1.244	269.8	0.422
60.8	22.53	131	4.456	201.2	1.207	271.6	0.412
62.6	21.51	132.8	4.294	203	1.171	273.4	0.401
64.4	20.54	134.6	4.139	204.8	1.136	275.2	0.391
66.2	19.63	136.4	3.99	206.6	1.103	277	0.382

Appendix 2: Resistance Table of Outdoor and Indoor Tube Temperature Sensors(20K)

Temp.（˚F）	Resistance（kΩ）	Temp.（˚F）	Resistance（kΩ）	Temp.（˚F）	Resistance（kΩ）	Temp.（˚F）	Resistance（kΩ）
-2.2	181.4	68	25.01	138.2	5.13	208.4	1.427
-0.4	171.4	69.8	23.9	140	4.948	210.2	1.386
1.4	162.1	71.6	22.85	141.8	4.773	212	1.346
3.2	153.3	73.4	21.85	143.6	4.605	213.8	1.307
5	145	75.2	20.9	145.4	4.443	215.6	1.269
6.8	137.2	77	20	147.2	4.289	217.4	1.233
8.6	129.9	78.8	19.14	149	4.14	219.2	1.198
10.4	123	80.6	18.13	150.8	3.998	221	1.164
12.2	116.5	82.4	17.55	152.6	3.861	222.8	1.131
14	110.3	84.2	16.8	154.4	3.729	224.6	1.099
15.8	104.6	86	16.1	156.2	3.603	226.4	1.069
17.6	99.13	87.8	15.43	158	3.481	228.2	1.039
19.4	94	89.6	14.79	159.8	3.364	230	1.01
21.2	89.17	91.4	14.18	161.6	3.252	231.8	0.983
23	84.61	93.2	13.59	163.4	3.144	233.6	0.956
24.8	80.31	95	13.04	165.2	3.04	235.4	0.93
26.6	76.24	96.8	12.51	167	2.94	237.2	0.904
28.4	72.41	98.6	12	168.8	2.844	239	0.88
30.2	68.79	100.4	11.52	170.6	2.752	241	0.856
32	65.37	102.2	11.06	172.4	2.663	242.8	0.833
33.8	62.13	104	10.62	174.2	2.577	244.6	0.811
35.6	59.08	105.8	10.2	176	2.495	246.4	0.77
37.4	56.19	107.6	9.803	177.8	2.415	248.2	0.769
39.2	53.46	109.4	9.42	179.6	2.339	250	0.746
41	50.87	111.2	9.054	181.4	2.265	251.8	0.729
42.8	48.42	113	8.705	183.2	2.194	253.6	0.71
44.6	46.11	114.8	8.37	185	2.125	255.4	0.692
46.4	43.92	116.6	8.051	186.8	2.059	257.2	0.674
48.2	41.84	118.4	7.745	188.6	1.996	259	0.658
50	39.87	120.2	7.453	190.4	1.934	260.8	0.64
51.8	38.01	122	7.173	192.2	1.875	262.6	0.623
53.6	36.24	123.8	6.905	194	1.818	264.4	0.607
55.4	34.57	125.6	6.648	195.8	1.736	266.2	0.592
57.2	32.98	127.4	6.403	197.6	1.71	268	0.577
59	31.47	129.2	6.167	199.4	1.658	269.8	0.563
60.8	30.04	131	5.942	201.2	1.609	271.6	0.549
62.6	28.68	132.8	5.726	203	1.561	273.4	0.535
64.4	27.39	134.6	5.519	204.8	1.515	275.2	0.521
66.2	26.17	136.4	5.32	206.6	1.47	277	0.509

Appendix 3: Resistance Table of Outdoor Discharge Temperature Sensor(50K)

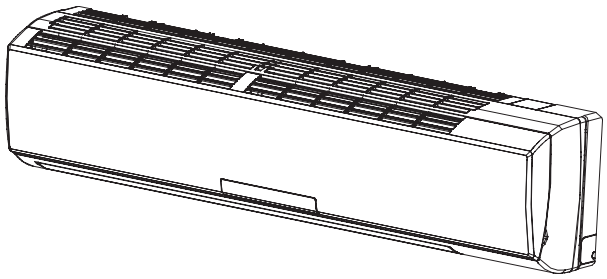
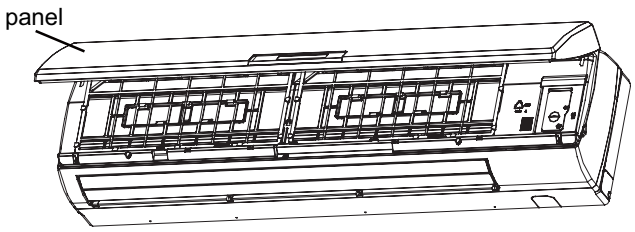
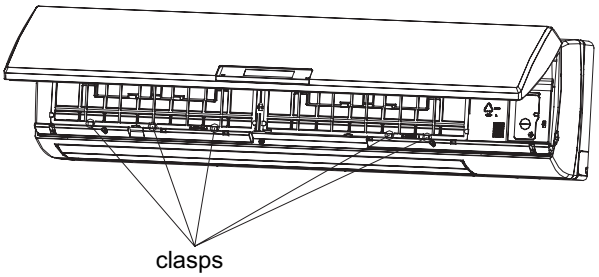
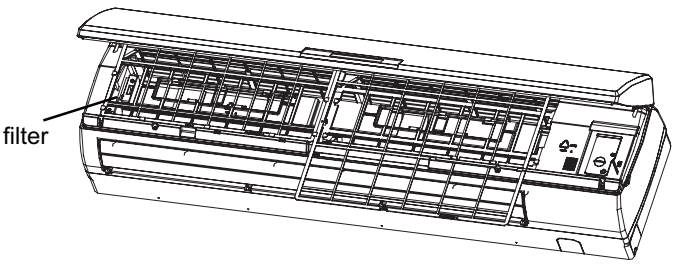
Temp.(˚F)	Resistance（kΩ）	Temp.(˚F)	Resistance（kΩ）	Temp.(˚F)	Resistance（kΩ）	Temp.(˚F)	Resistance（kΩ）
-20.2	853.5	50	98	120.2	18.34	190.4	4.754
-18.4	799.8	51.8	93.42	122	17.65	192.2	4.609
-16.6	750	53.6	89.07	123.8	16.99	194	4.469
-14.8	703.8	55.4	84.95	125.6	16.36	195.8	4.334
-13	660.8	57.2	81.05	127.4	15.75	197.6	4.204
-11.2	620.8	59	77.35	129.2	15.17	199.4	4.079
-9.4	580.6	60.8	73.83	131	14.62	201.2	3.958
-7.6	548.9	62.6	70.5	132.8	14.09	203	3.841
-5.8	516.6	64.4	67.34	134.6	13.58	204.8	3.728
-4	486.5	66.2	64.33	136.4	13.09	206.6	3.619
-2.2	458.3	68	61.48	138.2	12.62	208.4	3.514
-0.4	432	69.8	58.77	140	12.17	210.2	3.413
1.4	407.4	71.6	56.19	141.8	11.74	212	3.315
3.2	384.5	73.4	53.74	143.6	11.32	213.8	3.22
5	362.9	75.2	51.41	145.4	10.93	215.6	3.129
6.8	342.8	77	49.19	147.2	10.54	217.4	3.04
8.6	323.9	78.8	47.08	149	10.18	219.2	2.955
10.4	306.2	80.6	45.07	150.8	9.827	221	2.872
12.2	289.6	82.4	43.16	152.6	9.489	222.8	2.792
14	274	84.2	41.34	154.4	9.165	224.6	2.715
15.8	259.3	86	39.61	156.2	8.854	226.4	2.64
17.6	245.6	87.8	37.96	158	8.555	228.2	2.568
19.4	232.6	89.6	36.38	159.8	8.268	230	2.498
21.2	220.5	91.4	34.88	161.6	7.991	231.8	2.431
23	209	93.2	33.45	163.4	7.726	233.6	2.365
24.8	198.3	95	32.09	165.2	7.47	235.4	2.302
26.6	199.1	96.8	30.79	167	7.224	237.2	2.241
28.4	178.5	98.6	29.54	168.8	6.998	239	2.182
30.2	169.5	100.4	28.36	170.6	6.761	241	2.124
32	161	102.2	27.23	172.4	6.542	242.8	2.069
33.8	153	104	26.15	174.2	6.331	244.6	2.015
35.6	145.4	105.8	25.11	176	6.129	246.4	1.963
37.4	138.3	107.6	24.13	177.8	5.933	248.2	1.912
39.2	131.5	109.4	23.19	179.6	5.746	250	1.863
41	125.1	111.2	22.29	181.4	5.565	251.8	1.816
42.8	119.1	113	21.43	183.2	5.39	253.6	1.77
44.6	113.4	114.8	20.6	185	5.222	255.4	1.725
46.4	108	116.6	19.81	186.8	5.06	257.2	1.682
48.2	102.8	118.4	19.06	188.6	4.904	259	1.64

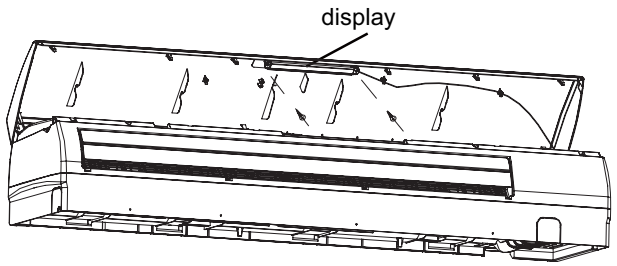
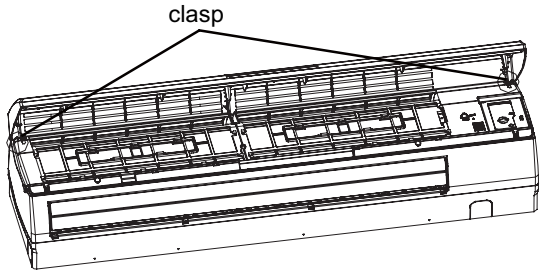
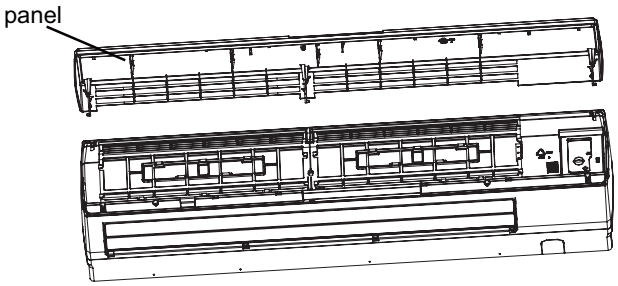
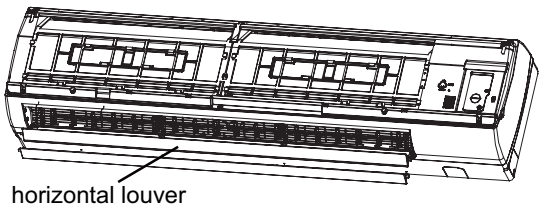
Note: The information above is for reference only.

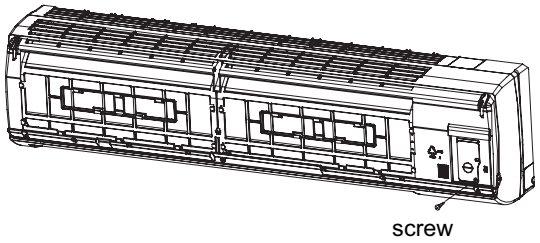
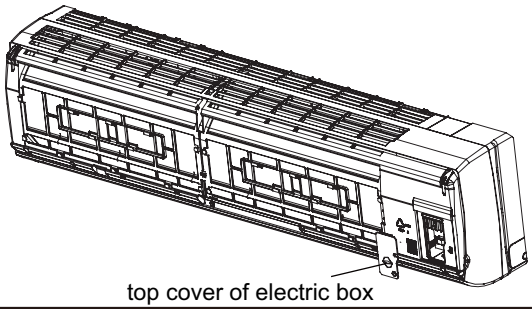
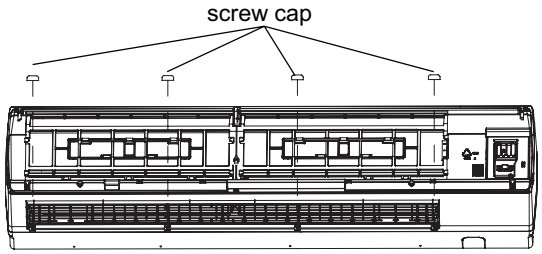
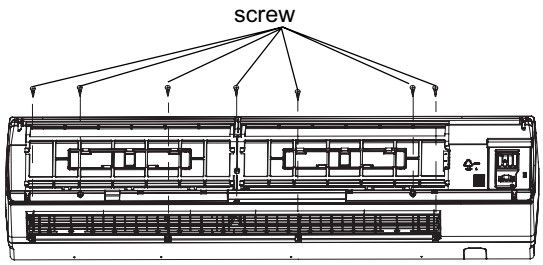
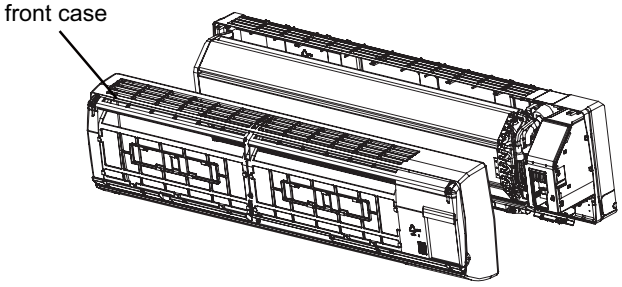
10. Removal Procedure

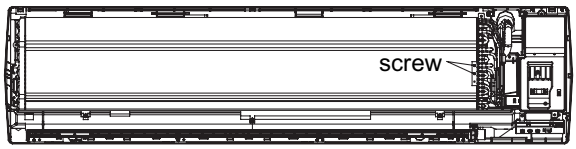
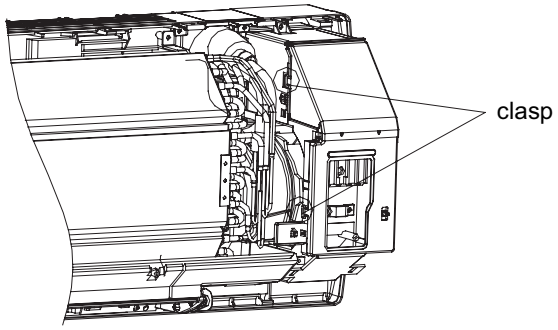
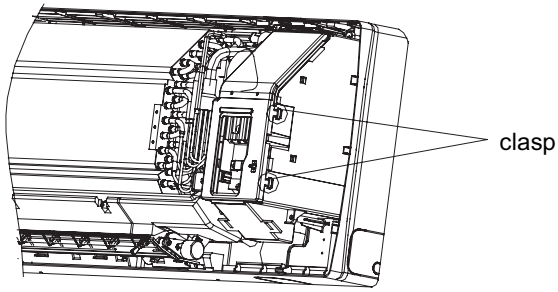
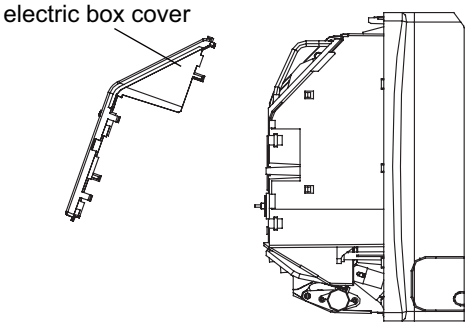
10.1 Removal Procedure of Indoor Unit

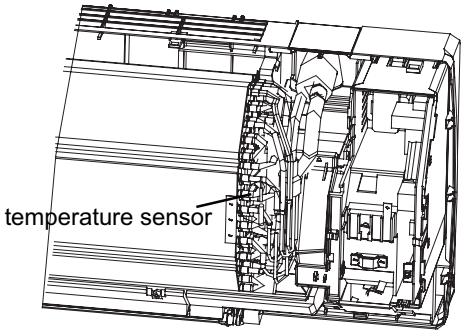
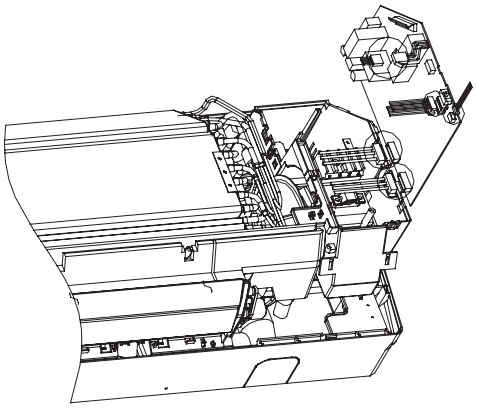
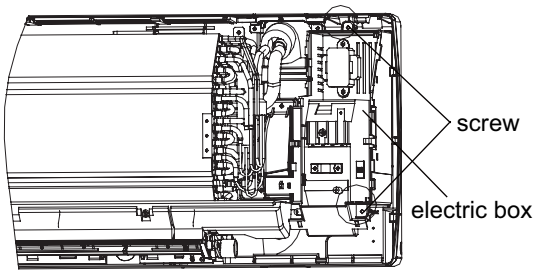
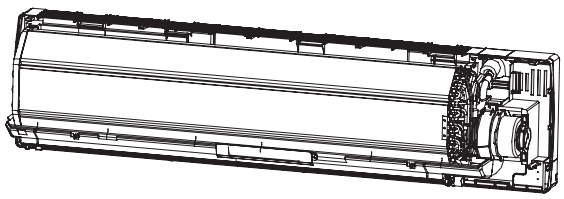
⚠ Warning Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.

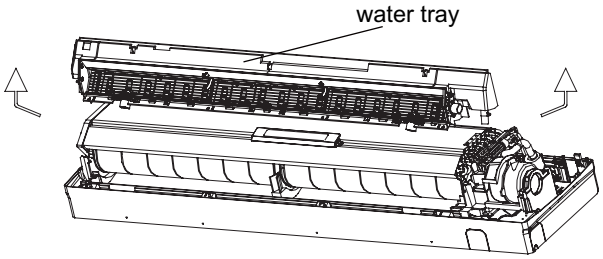
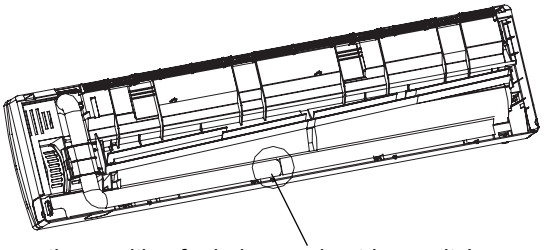
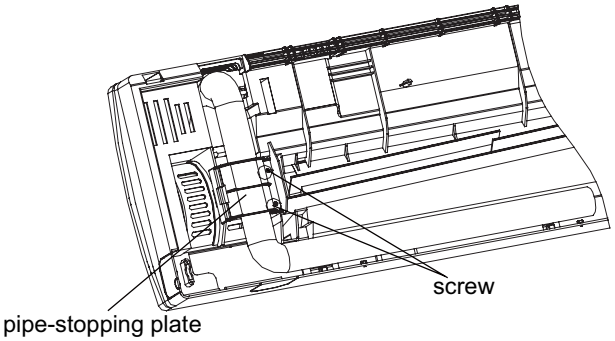
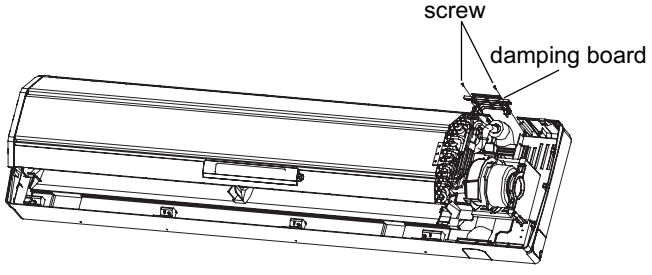
Steps	Procedure	
1.Before disassembly of the unit		
	Axonometric drawing for the complete unit.	
2.Remove filter		
1	Open the panel.	
2	Loosen the clasps on the filter.	
3	Draw out two pieces of filter.	

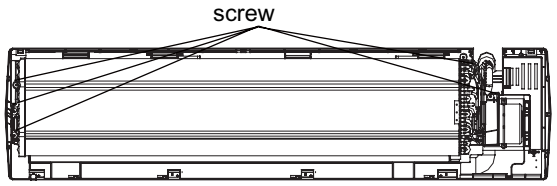
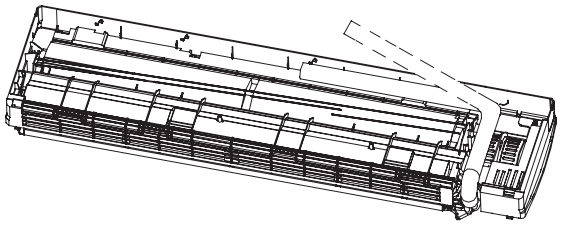
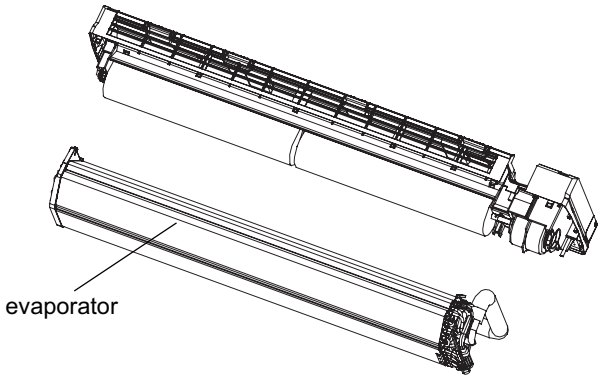
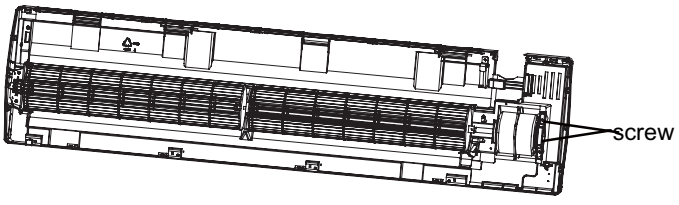
Steps	Procedure
3.Remove display	
Remove 2 screws fixing display, and then remove the filter.	
4.Remove panel	 
Pull the clasps at both sides slightly, and then remove the panel.	
5.Remove horizontal louver	
Remove the axial bush on the horizontal louver, and then remove the horizontal louver.	

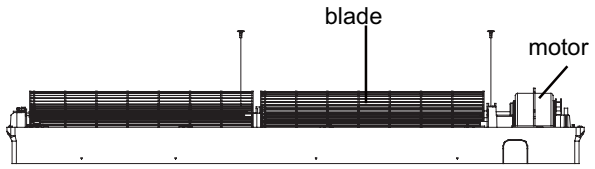
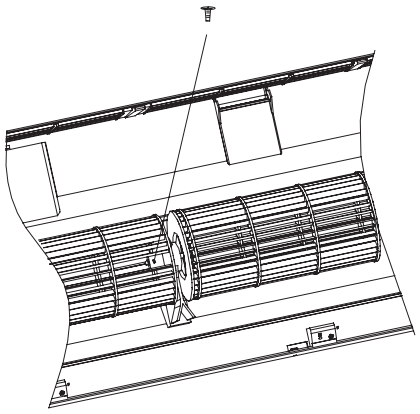
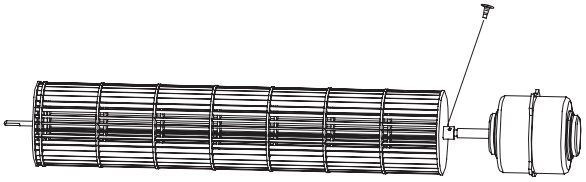
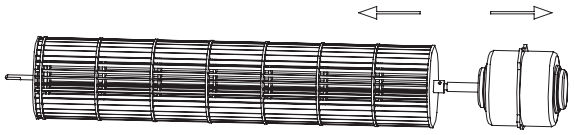
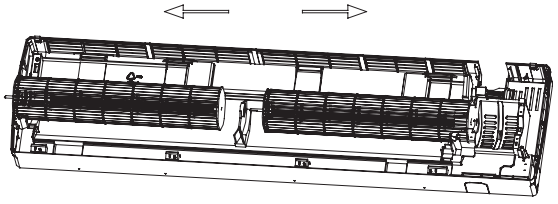
Steps	Procedure	
6.Remove top cover of electric box		
1	Remove screws fixing the top cover of electric box.	
2	Remove the top cover of electric box.	
7.Remove front case		
1	Remove the screw caps on front case.	
2	Remove screws connecting the front case.	
3	Remove the front case.	

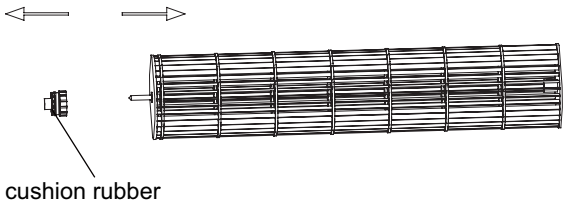
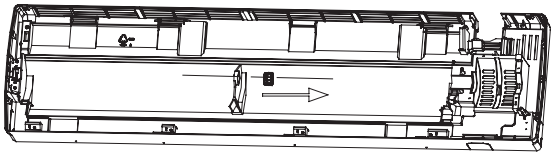
Steps	Procedure	
8.Remove earthing wire		
	Remove earthing screws, and then remove the earthing wire.	
9.Remove electric box cover		
1	Loosen clasps at the left side of electric box.	
2	Loosen clasps on the right side of electric box.	
3	Remove electric box cover.	

Steps	Procedure
10.Remove temperature sensor	
Pull out the indoor temperature sensor.	
11.Remove electric box	
1 Pull out 6 sockets on PCB board.	
2 Pull out two screws on electric box.	
3 Remove the electric box.	

Steps	Procedure
12.Remove water tray	
Pull the water tray upwards, and then remove the water tray.	
13.Remove connection pipe between indoor and outdoor units	
Separate the connection pipe between indoor and outdoor units.	
14.Remove pipe-stopping plate	
Remove two screws on pipe-stopping plate for indoor unit, and then remove the pipe-stopping plate.	
15.Remove damping board	
Remove 2 screws on damping board, and then remove the damping board.	

Steps	Procedure	
16.Remove evaporator		
1	Remove screws between evaporator and bottom case.	
2	Turn over the indoor unit and adjust the pipe line to the position as shown by the broken line.	
3	Lift up the evaporator, and then remove the evaporator.	
17.Remove the fixing plate of motor		
	Remove 2 screws on fixing plate of motor, and then remove the fixing pate of motor.	

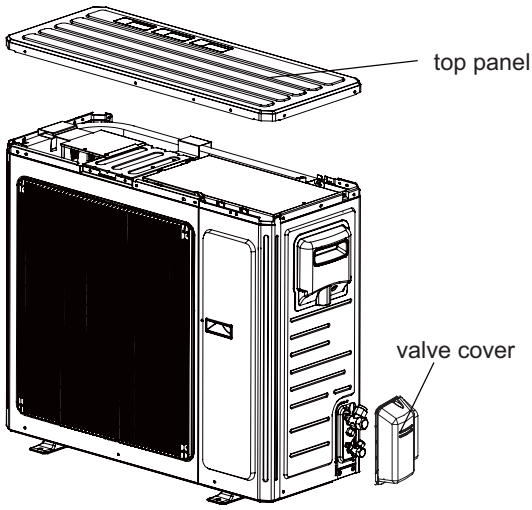
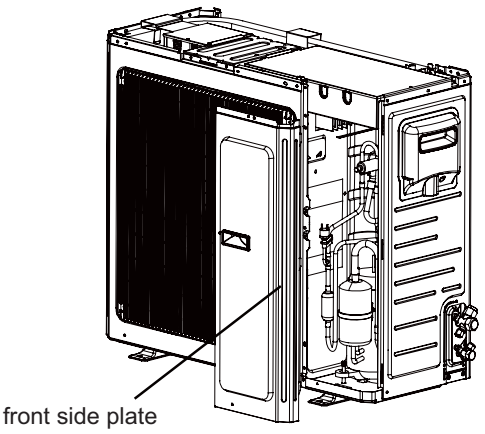
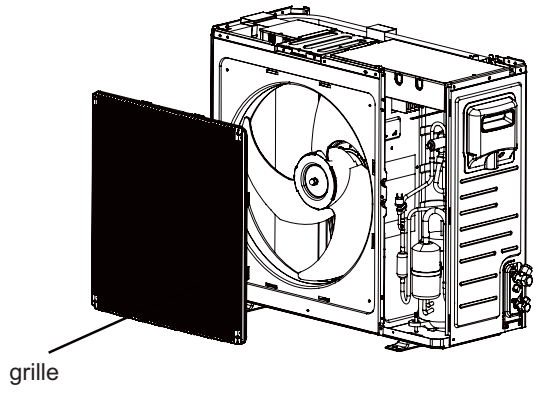
Steps	Procedure	
18.Remove cross flow blade and motor		
1	Remove screws fixing cross flow blade and motor.	
		
		
2	Remove the motor sub-assy.	
3	Separate two cross flow blade.	

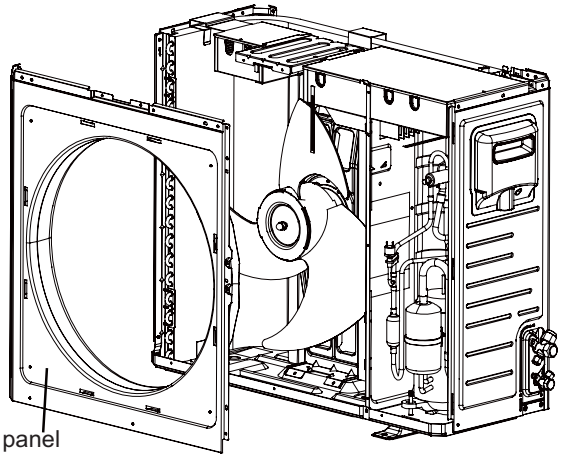
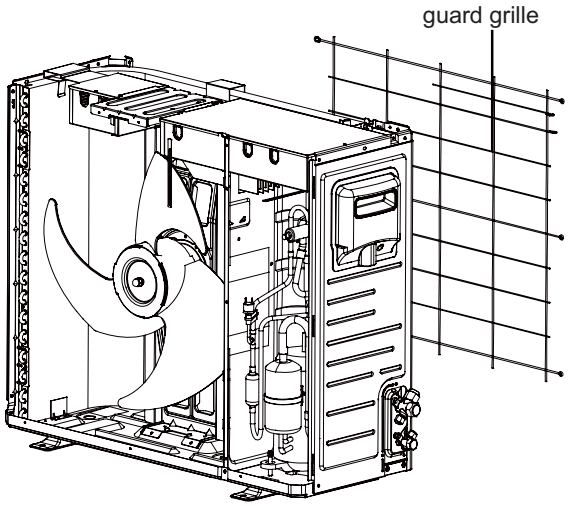
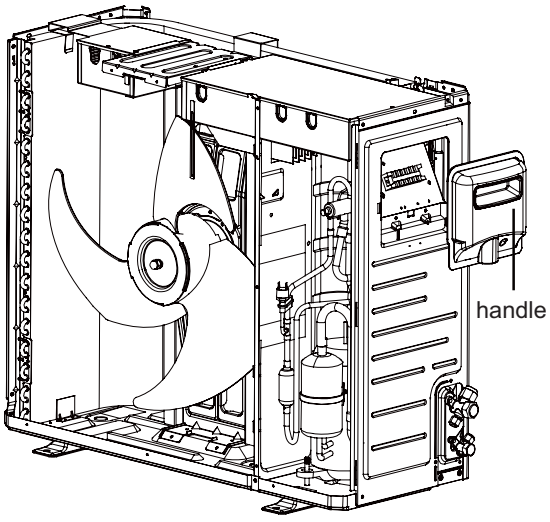
Steps	Procedure	
19.Remove cushion rubber		
1	Remove the cushion rubber on cross flow blade.	
2	Remove the cushion rubber from the base.	

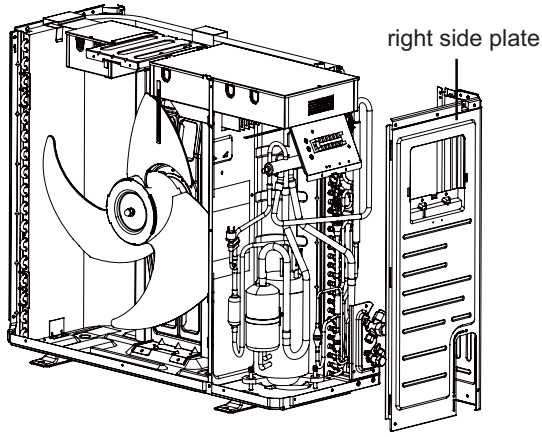
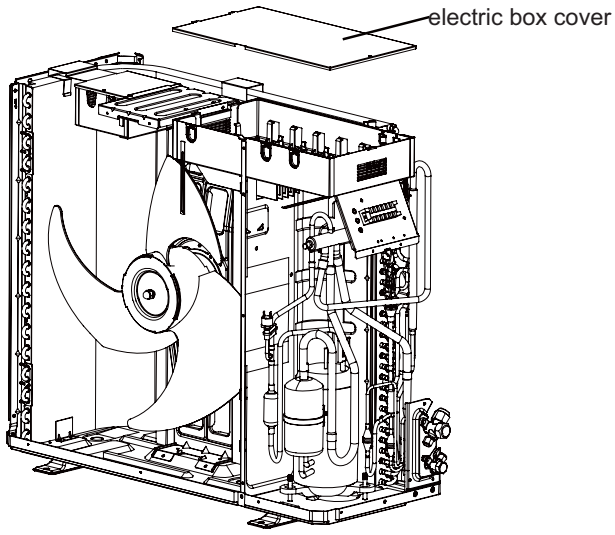
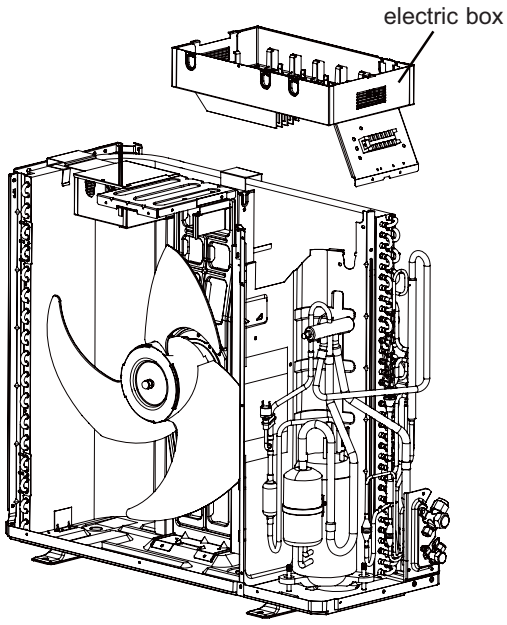
10.2 Removal Procedure of Outdoor Unit

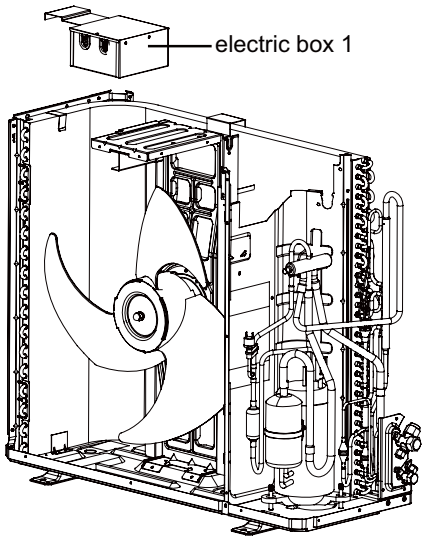
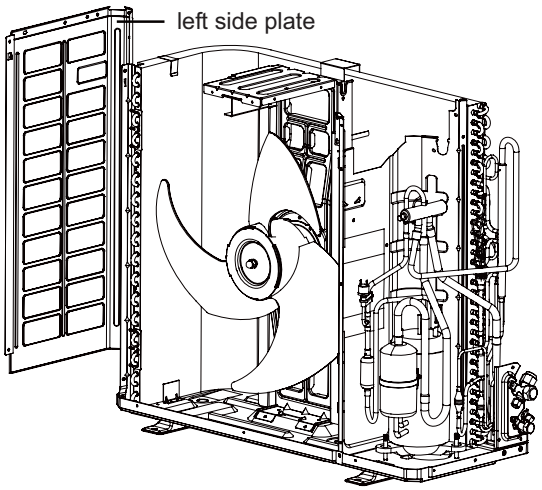
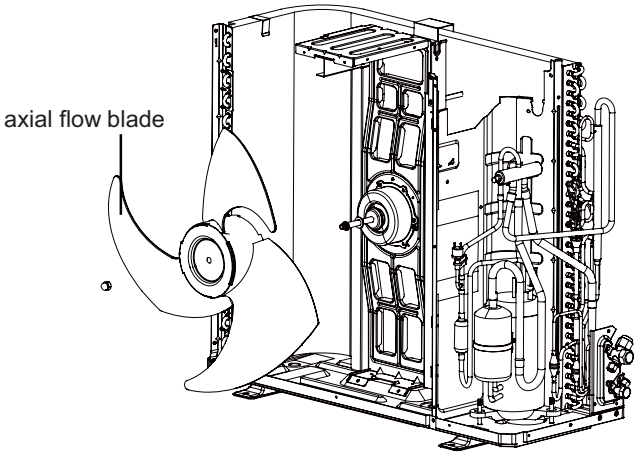
⚠ Warning Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.

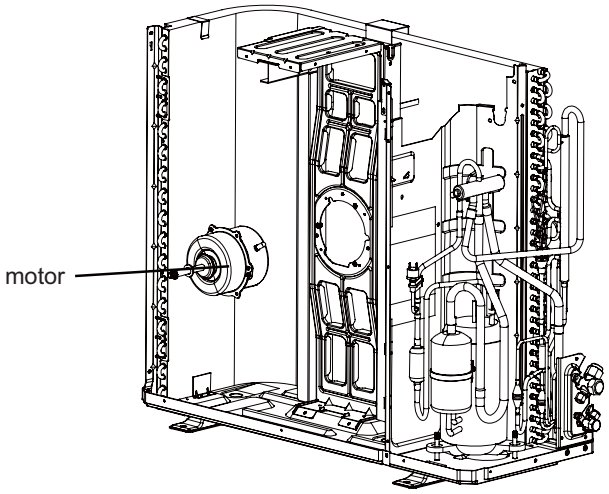
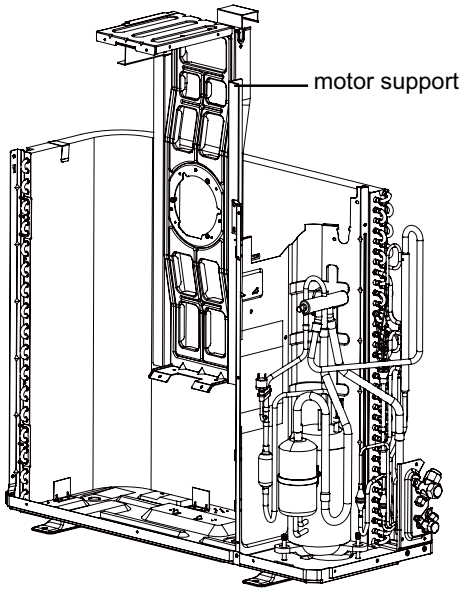
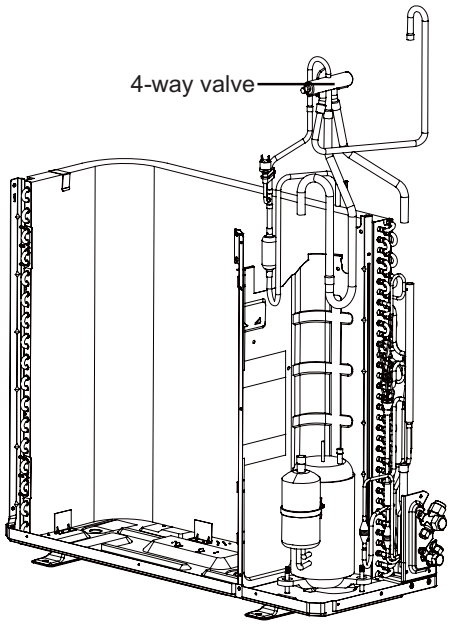
NOTE: Take GWH36LB-D3DNA3A/O for example. Electric heater band is not shown below.

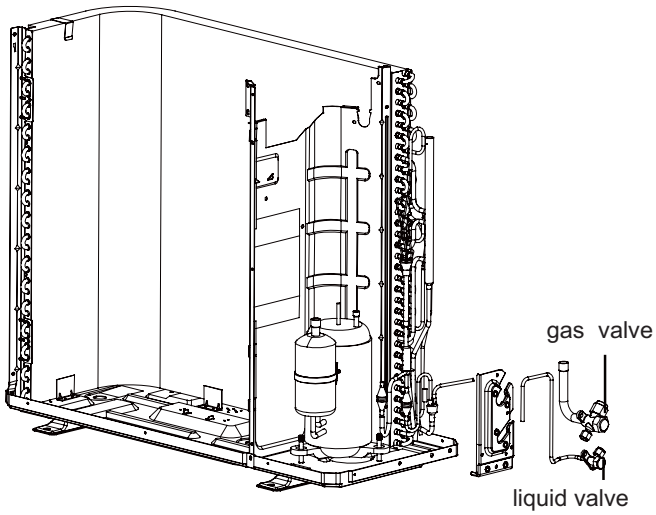
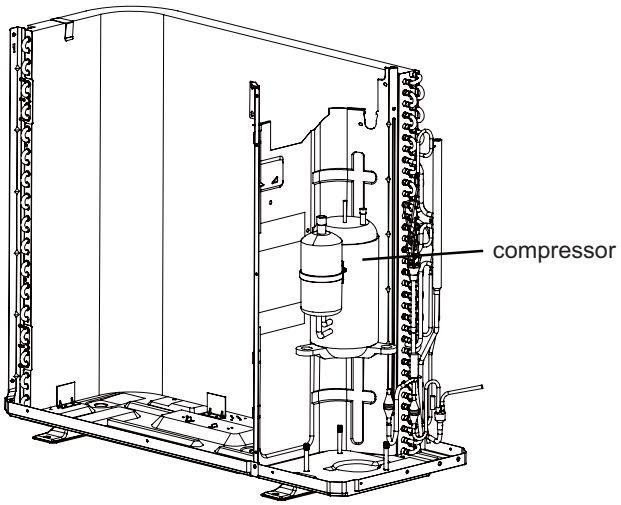
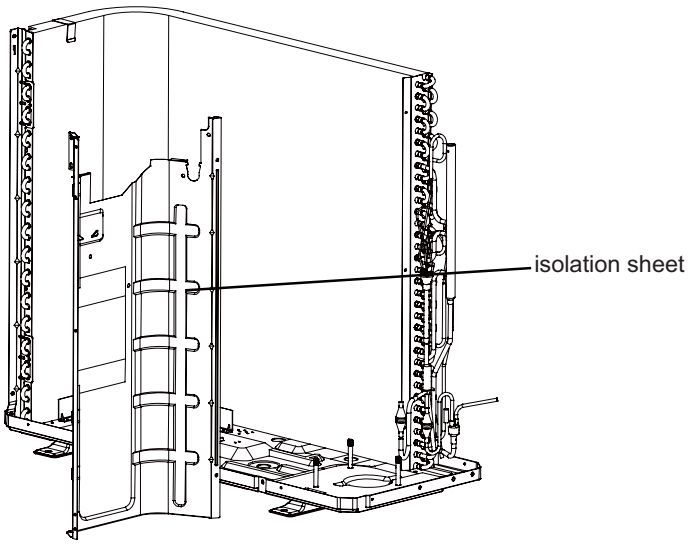
Step	Procedure	
1. Remove top cover and front side plate		
a	Use the screwdriver to remove the screws connecting the top panel and panel and side panels. Remove the top panel.Loosen the screws fixing the valve cover and then remove the valve cover.	
b	Loosen the screws connecting the front side panel and mask and chassis. Remove the front side panel.	
2. Remove grille		
	Twist off the screws connecting the grille and panel, and then remove the grille.	

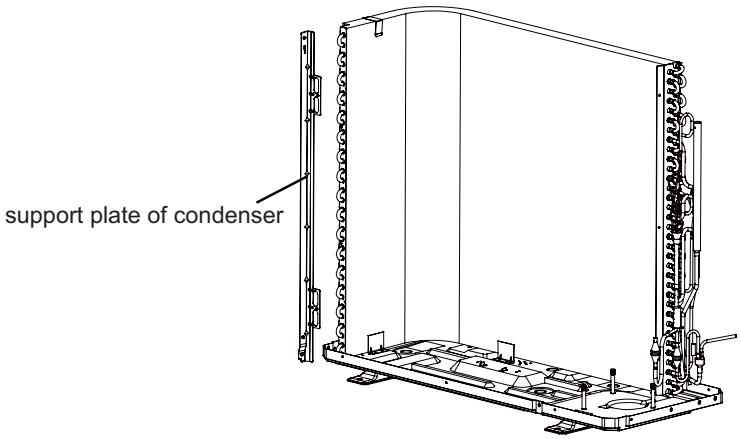
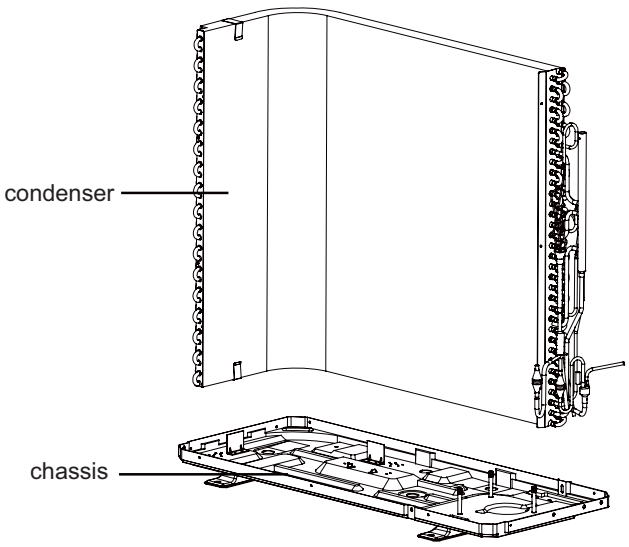
Step	Procedure
3. Remove panel Twist off the screws connecting the panel, chassis and motor support with screwd-river, and then remove the panel.	
4. Remove guard grille Twist off the screws fixing the guard grille and then remove the guard grille.	
5. Remove handle Twist off the screws fixing the handle and then remove the handle.	

Step	Procedure
6. Remove right side plate	
Twist off the screws connecting the right side plate and chassis, valve support and condenser, and then remove the right side plate.	
7. Remove electric box	
a Twist off the screws on electric box cover with screwdriver, and then remove the electric box cover.	
b Twist off the screws on electric box, cut off the tieline with scissors or pliers, pull out the wiring terminal, pull it upwards to remove the electric box.	

Step	Procedure	
c	Twist off the screws between electric box 1 and left side plate with screwdriver, pull it upwards to remove the electric box 1.	
8. Remove left side plate		
	Twist off the screws connecting the left side plate and chassis with screwdriver, and then remove the left side plate.	
9. Remove axial flow blade		
	Twist off the nuts on blade with wrench and then remove the axial flow blade.	

Step	Procedure
10. Remove motor and motor support	
a Twist off the tapping screws fixing the motor, pull out the pin of leading wire for motor and then remove the motor.	
b Twist off the tapping screws fixing the motor support, pull it upwards and then remove the motor support.	
11. Remove 4-way valve	
Unsolder the pipeline between compressor, condenser, gas and liquid valve, and then remove the 4-way valve. (note: release all refrigerant before unsoldering).	

Step	Procedure
12. Remove gas valve and liquid valve Twist off the 2 bolts fixing the valve sub-assy. Unsolder the soldering joint between gas valve and air-return pipeand then remove the gas valve.(note: when unsoldering the soldering joint, wrap the gas valve with wet cloth completely to avoid the damage to valve, and release all refrigerant completely at first). Unsolder the soldering joint between liquid valve and connection pipe of liquid valve, and then remove the liquid valve.	
13. Remove compressor Twist off the 3 foot nuts on compressor and then remove the compressor.	
14. Remove isolation sheet Twist off the screws connecting isolation sheet and end plate of condenser and chassis, and then remove the isolation sheet.	

Step	Procedure
15. Remove support plate of condenser Twist off the screws connecting the support plate of condenser and condenser with screwdriver, and then remove the support plate of condenser.	
16. Remove chassis and condenser Pull it upwards to separate the chassis and condenser.